C21.5: 960/3

Vol. 960 Number 3

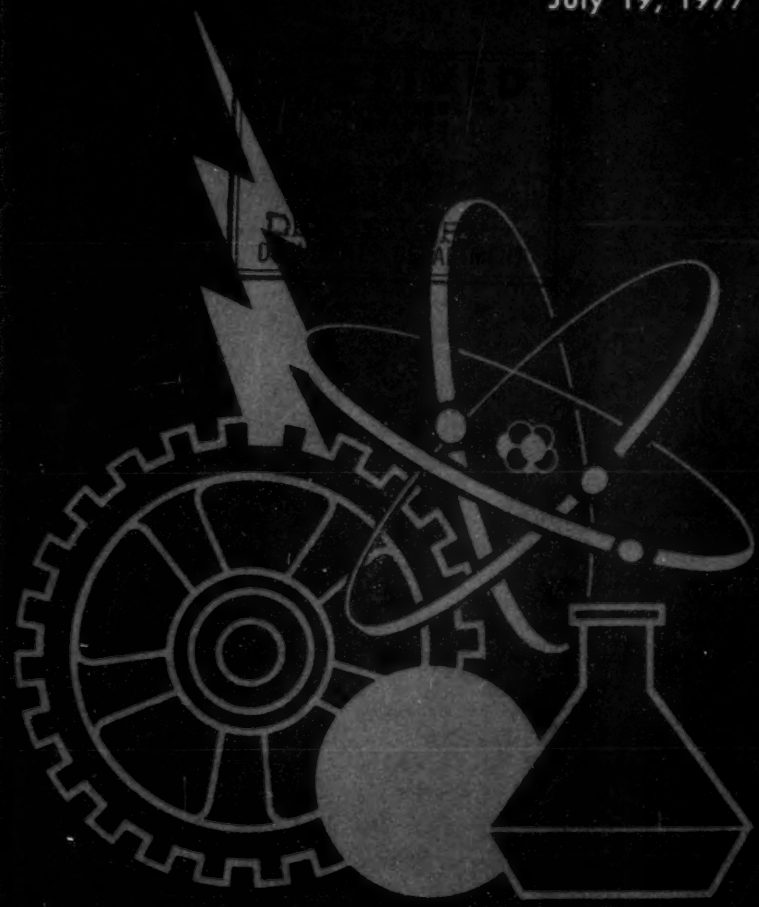
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 19, 1977



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 19, 1977 Volume 960 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,798,213, W. G. Rowell, CHECKING TECHNIQUE AND SYSTEM; **2,798,214,** same, **filed** Mar. 18, 1977, United States Court of Appeals, First Circuit, Mass. (Boston) Doc. 77–1133, *Scully Signal Company* v. *Electronics Corporation of America.* **Same, filed** Mar. 25, 1977, United States Court of Appeals, First Circuit, Mass. (Boston) Doc. 77–1144, *Scully Signal Company* v. *Electronics Corporation of America.*

2,798,214. (See 2,798,213.)

3,063,457, Bittner and Gnass, FOOT EXERCISER SANDALS, **filed** Mar. 21, 1977, D.C., E.D. Mo. (St. Louis) Doc. 77–301–C(1), *Scholl, Inc.* v. *Modern Shoe Co., H. A. Waltuch, Robert J. Gamm and Michael Mathis.* **Same, filed** Feb. 15, 1977, D.C., S.D.N.Y., Doc. 77–C–755 KTD, *Melville Corporation et ano.* v. *Scholl, Inc.*

3,082,292, R. W. Gore, MULTICONDUCTOR WIRING STRIP; **3,540,956,** Arnold and Gore, PRECISE CONDUCTOR CABLES, **filed** Feb. 13, 1973, D.C., N.D. Ohio (Cleveland) Doc. C73–163, *W. L. Gore & Associates, Inc.* v. *A.P. Inc.* Consent judgment permanently enjoining defendant from infringing or contributing to the infringement of any claim of Patent Number 3,082,292. Patent Number 3,540,956 is invalid, Dec. 23, 1976.

3,161,993, G. W. Balz, FINISHING APPARATUS AND METHOD; **3,161,997,** same, FINISHING APPARATUS AND POLISHING METHOD, **filed** May 7, 1971, D.C., N.D. Ill. (Chicago) Doc. 71c1108, *Roto-Finish Company* v. *Eltramatic Equipment Co.* Final judgment by consent entered Nov. 17, 1976.

3,161,997. (See 3,161,993.)

3,218,588, J. G. Badger, TELEVISION TUNER; **3,842,683,** A. A. Valdettaro, UHF TUNER ARRANGEMENT, **filed** Sept. 26, 1975, D.C., E.D. Va. (Norfolk) Doc. C/A 75–504–N, *Sarkes Tarzian, Inc.* v. *Misumi Electric Co., Ltd. and General Electric Company.* It is hereby stipulated that the complaint, the first amended complaint and the second amended complaint in this action insofar as they pertain to defendant Mitsumi Electric Co., Ltd. be dismissed without prejudice, Mar. 4, 1977.

3,304,636, Viecell and Walczak, HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON; **3,335,507,** J. L. Viecell, HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON; **3,541,306,** Barnas and Gronwick, ELECTRIC PRESSING IRON; **3,599,357,** Gronwick and Westphal, ELECTRIC PRESSING IRON; **3,691,660,** Gronwick, Illian and Westphal, ELECTRIC PRESSING IRON, **filed** Dec. 7, 1972, D.C. Del. (Wilmington) Doc. 4533, *Scovill Manufacturing Company* v. *Sunbeam Corporation.* Order—The complaint and amended and supplemental complaint, and the counterclaim and amended counterclaim are hereby dismissed without prejudice. This civil action is hereby terminated, Nov. 16, 1976.

3,335,507. (See 3,304,636.)

3,421,678, Thompson and Ihde, PROFILE COATED CARTON; **3,976,527,** same, METHOD OF EXTRUDING THERMOPLASTIC FILMS, **filed** Dec. 17, 1976, D.C., S.D.N.Y., Doc. 76–C–5631, *International Paper Company* v. *Champion International Corporation.*

3,509,833, R. L. Cook, HARD FACED CERAMIC AND PLASTIC ARMOR; **3,516,898,** same, HARD FACED PLASTIC ARMOR, **filed** Mar. 18, 1977, D.C., N.D. Ohio (Akron) Doc. C77–101A, *Goodyear Aerospace Corporation* v. *The United States of America.*

3,511,233, E. Holy, Jr., FOOT PROTECTOR, **filed** Dec. 17, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–2062A, *Dillon Manufacturing Company, Inc.* v. *Jimmie G. Reagan, doing business as Deputy-Reagan Associates and King Manufacturing Company, Inc.*

3,516,898. (See 3,509,833.)

3,540,956. (See 3,082,292.)

3,541,306. (See 3,304,636.)

3,554,618, Ditzler and Carswell, Jr. and Reisch, RAILROAD TRUCKS, **filed** Mar. 8, 1977, D.C. Calif. (San Francisco) Doc. C77–0483SW, *Sam Houston, doing business as Modern Transportation Supplies* v. *The Polymer Corporation.*

3,599,357. (See 3,304,636.)

3,646,007, P. Gordon, COMPLEX OF INOSINE WITH DIALKYLAMINOALKANOL; **3,728,450,** same, INOSINE DERIVATIVES; **3,857,940,** same, **filed** Dec. 7, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–3771–FW, *Newport Pharmaceuticals International* v. *Paul Gordon.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Apr. 30, 1976, D.C., W.D.N.C. (Statesville) Doc. ST–C–76–14, *Tights, Inc.* v. *Cabarrus Hosiery Company (Arrowood Mills of N.C., Inc.).* Pursuant to the provisions of Rule 41(a)(1) of the Federal Rules of Civil Procedure, all parties hereby stipulate and agree that all claims are hereby dismissed with prejudice, May 21, 1977.

3,691,660. (See 3,304,636.)

3,728,450. (See 3,646,007.)

3,733,657, G. B. Lankton, ASSEMBLY OF ATTACHMENTS AND METHOD OF MANIPULATING THE SAME, **filed** Mar. 22, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c951, *Dennison Mfg. Co.* v. *Tamp Corp.*

3,792,163, S. J. Fudro, EGG DECORATING DEVICE, **filed** Apr. 9, 1975, D.C., E.D.N.Y. (Brooklyn) Doc. 75C524, *Easter Unlimited, Inc.* v. *Spearhead Marketing Inc. and William Blanck.* Final judgment on consent granting permanent injunction, entered Aug. 11, 1975.

3,842,683. (See 3,218,518.)

3,845,754, A. L. Wilkening, FIREPLACE HOME HEATER, **filed** Mar. 18, 1977, D.C. Minn. (St. Paul) Doc. 2–77–134, *Albert L. Wilkening* v. *Robert S. Messer, doing business as Messer Machine and Manufacturing.*

3,857,940. (See 3,646,007.)

3,871,585, Crossman, Kenrick and Le Mieux, AIR BED; **3,887,187,** same, AIR CUSHION TABLE GAME; **3,927,885,** same, PUCK AND BAT FOR AN AIR CUSHION TABLE GAME, **filed** Oct. 14, 1976, D.C., S.D.N.Y., Doc. 76–C–4555, *Brunswick Corporation* v. *Munroe Games, Inc.* It is hereby stipulated that the above action be dismissed with prejudice, Mar. 16, 1977.

3,887,187. (See 3,871,585.)

3,927,885. (See 3,871,585.)

3,928,933, T. Iwamoto, HOLDING TOY, **filed** Mar. 16, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–987–HP, *ITI Hawaii, Inc. et al.* v. *Nan Ho Kim.*

3,976,527. (See 3,421,678.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 28,041, Re. S.N. 802,236, Filed May 31, 1977, Cl. 240/3, MULTIPLE STAGE EXTENSIBLE BOOM, Erich W. Loffler, et al., Owner of Record: *Electro Motion Pacific, Inc., Redwood City, Calif.*, Attorney or Agent: Julian Caplan, Ex. Gp.: 212

3,036,036, Re. S.N. 798,536, Filed May 19, 1977, Cl. 260/47, PHENOLPHTHALEIN-POLYCARBONATE RESINS, Joseph H. Howe, Owner of Record: *The Dow Chemical Company, Midland, Mich.*, Attorney or Agent: M. B. Lilly, et al., Ex. Gp.: 143

3,414,510, Re. S.N. 801,075, Filed May 27, 1977, Cl. 210/37 R, METHOD FOR SELECTIVELY REMOVING CHROMATES, Alfred W. Oberhofer, Owner of Record: *Nalco Chemical Company, Chicago, Ill.,* Attorney or Agent: Roy E. Hofer, et al., Ex. Gp.: 176

3,714,382, Re. S.N. 800,481, Filed May 25, 1977, Cl. 179/100.2 S, METHOD AND SYSTEM FOR BIDIRECTIONAL SEARCH AND POSITIONING MAGNETIC RECORDING TAPE USING A REEL TURN SENSOR CONTROLLED COARSE POSITIONING, John R. Sykes, Owner of Record: *Sykes Datatronics, Inc., Rochester, N.Y.,* Attorney or Agent: Martin Lukacher, Ex. Gp.: 235

3,777,466, Re. S.N. 794,237, Filed May 5, 1977, Cl. 57/58.89, METHOD OF REMOVING IMPURITIES AND SIMILAR MATTER FROM STAPLE FIBRES IN RING-LESS SPINNING AND DEVICE FOR PERFORMING SAID METHOD, Stanislav Kabele, et al., Owner of Record: *Inventors,* Attorney or Agent: Michael J. Striker, et al., Ex. Gp.: 244

3,881,458, Re. S.N. 793,953, Filed May 5, 1977, Cl. 123/128 E, IGNITION SYSTEM DEPENDENT UPON ENGINE SPEED, Herman Roozenbeek, et al., Owner of Record: *Robert Bosch GmbH, Stuttgart, Germany,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 342

3,884,610, Re. S.N. 798,909, Filed May 20, 1977, Cl. 425/387 B, BLOW-MOLDING APPARATUS, Johannes S. Mehnert, Owner of Record: *Inventor,* Attorney or Agent: Norman S. Blodgett, Ex. Gp.: 322

3,886,389, Re. S.N. 799,859, Filed May 23, 1977, Cl. 313/188, DISPLAY PANEL, James A. Ogle, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

3,887,244, Re. S.N. 801,717, Filed May 31, 1977, Cl. 305/57, RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK, Glenn M. Haslett, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, et al., Ex. Gp.: 311

3,890,157, Re. S.N. 802,276, Filed May 31, 1977, Cl. 106/89, CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS, Henry Nash Babcock, Owner of Record: *Construction Products Research, Inc., Old Greenwich, Conn.,* Attorney or Agent: Alphonse R. Noë, Ex. Gp.: 115

3,916,240, Re. S.N. 791,488, Filed Apr. 27, 1977, Cl. 313/102, IMAGE INTENSIFIER TUBE DEVICE, Augustinus Joannes Cuelenaere, et al., Owner of Record: *Inventors,* Attorney or Agent: Louis E. Marn, et al., Ex. Gp.: 252

3,921,733, Re. S.N. 799,611, Filed May 23, 1977, Cl. 175/65, METHOD OF DRILLING A BOREHOLE USING GELLED POLYMERS, Richard L. Clampitt, et al., Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 354

3,940,422, Re. S.N. 802,486, Filed June 1, 1977, Cl. 260/340.5, AROMATIC CARBOXYLIC AMIDE DERIVATIVES, Kozaburo Harita, et al., Owner of Record: *Kissei Yakuhin Kogyo Kabushiki Kaisha (Kissei Pharmaceutical Co., Ltd.), Nagano-ken, Japan,* Attorney or Agent: George A. Depaoli, et al., Ex. Gp.: 124

3,959,565, Re. S.N. 792,716, Filed May 2, 1977, Cl. 428/432, TIN OXIDE COATING, John F. Jordan, et al., Owner of Record: *Photon Power, Inc., Wilmington, Del.,* Attorney or Agent: Edmund F. Bard, et al., Ex. Gp.: 164

3,966,269, Re. S.N. 796,784, Filed May 13, 1977, Cl. 303/37, FLUID BRAKE CONTROL SYSTEM, Eugene Douglas McEathron, Owner of Record: *General Signal Corporation, Rochester, N.Y.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 315

3,974,125, Re. S.N. 795,663, Filed May 10, 1977, Cl. 260/40 R, HIGHER DIALKYL DIMETHYL AMMONIUM CLAY GELLING AGENTS FOR UNSATURATED POLYESTER COMPOSITIONS, Alexis A. Oswald, et al., Owner of Record: *Exxon Research and Engineering Company, Linden, N.J.,* Attorney or Agent: Robert I. Pearlman, et al., Ex. Gp.: 141

PATENT NOTICES

Certificates of Correction for the Week of July 19, 1977

Re. 29,118	4,004,574	4,014,790	4,019,727
Re. 29,184	4,005,584	4,014,851	4,019,797
D. 243,259	4,005,905	4,014,855	4,019,938
3,721,718	4,006,123	4,015,045	4,019,959
3,725,454	4,006,216	4,015,135	4,019,991
3,776,940	4,006,293	4,015,181	4,020,064
3,781,174	4,007,197	4,015,185	4,020,256
3,784,603	4,007,892	4,015,692	4,020,424
3,840,339	4,008,205	4,015,730	4,020,454
3,856,779	4,008,405	4,015,883	4,020,477
3,880,206	4,008,424	4,015,927	4,020,492
3,889,848	4,008,754	4,016,072	4,020,499
3,916,995	4,008,884	4,016,093	4,020,535
3,918,913	4,009,196	4,016,156	4,020,588
3,920,733	4,009,246	4,016,167	4,020,737
3,928,409	4,009,411	4,016,232	4,020,755
3,940,947	4,009,563	4,016,233	4,020,938
3,941,587	4,009,815	4,016,236	4,021,024
3,943,156	4,009,940	4,016,538	4,021,156
3,946,301	4,010,248	4,016,594	4,021,341
3,958,781	4,010,279	4,017,272	4,021,486
3,960,729	4,010,422	4,017,983	4,021,531
3,967,429	4,010,761	4,018,010	4,021,568
3,968,125	4,011,023	4,018,105	4,021,572
3,968,384	4,011,094	4,018,226	4,021,660
3,974,696	4,011,103	4,018,275	4,021,666
3,975,355	4,011,192	4,018,329	4,021,748
3 976,843	4,011,293	4,018,364	4,021,845
3,977,202	4,011,346	4,018,656	4,021,863
3,979,419	4,011,376	4,018,720	4,021,879
3,985,552	4,011,461	4,018,795	4,021,945
3,986,859	4,011,465	4,018,824	4,022,069
3,989,880	4,011,580	4,018,842	4,022,587
3,991,884	4,012,493	4,018,872	4,022,597
3,992,225	4,012,997	4,018,873	4,022,613
3,992,336	4,013,234	4,018,927	4,022,663
3,993,801	4,013,272	4,019,029	4,022,820
3,996,657	4,013,315	4,019,234	4,023,122
3,997,237	4,013,409	4,019,305	4,023,274
3,999,685	4,013,480	4,019,487	4,023,905
4,000,436	4,013,713	4,019,586	4,023,917
4,003,303	4,014,027	4,019,620	4,024,055
4,003,716	4,014,437	4,019,700	4,026,149
4,003,733	4,014,482	4,019,719	4,028,303
4,004,337	4,014,566	4,019,721	

Service by Publication

Larry G. Strayer

In accordance with 37 CFR 1.47(b) (Rules of Practice in Patent Cases), notice is hereby given of the filing on November 29, 1974, of an application for patent, Serial Number 528,434, entitled Computer Control of Moving Objects Such as Aircraft Moving From One Sector to Another, on behalf of Larry G. Strayer, whose last known address is 10300 Stafford Lane, Chatsworth, California 91311. The application was made in compliance with 37 CFR 1.47(b) and 35 U.S.C. 118 by World Traffic Control Systems, Inc. without execution by the said Larry G. Strayer. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Larry G. Strayer in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents and Trademarks.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 18, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-11-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-1-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-10-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during June 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,939,145 to 2,943,326, inclusive

Plant Patents..... Numbers 1,950 to 1,956, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,307

MANUFACTURE OF METALLIC CONTAINERS

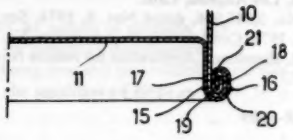
Eugène Wessely, Colombes, France, assignor to Futs Metalliques Gallay S.A., Paris, France

Original No. 3,425,381, dated Feb. 4, 1969, Ser. No. 558,352, June 17, 1966. Application for reissue June 24, 1976, Ser. No. 699,265

Claims priority, application France, June 18, 1965, 65.21391

Int. Cl.[2] B21D *51/32*

U.S. Cl. 113—120 R 6 Claims



5. A process of connecting bases in the ends of metal container bodies by seaming together contiguous peripheral portions of the bases and the container body ends, comprising supporting a container body, inserting a recessed portion of a base within one end of the container body, a bent over peripheral portion of the base and a bent over peripheral portion of the container body end freely overlying each other with the base peripheral portion extending radially beyond the container end peripheral portion, moving a seaming tool radially towards the still free edges of said peripheral portions while effecting continuous rotary movement of said container body and base relative to said tool about the longitudinal axis of said container body to force said base peripheral portion alone on itself in a continuous roll-over movement around the edge of the container end peripheral portion until the outer extremity of the base peripheral portion faces said container end peripheral portion, and effecting further movement of said tool radially inwardly with respect to said base and container body progressively to roll said base peripheral portion and said container end peripheral portion together over each other during which further movement said outer extremity of said base peripheral portion is displaced relative to its position facing said container end peripheral portion and continuing said further movement until a roll-over joint between said base and container end peripheral portions is formed which consists of seven superposed alternating thicknesses of said base and container body peripheral portions.

Re. 29,308

PROTECTIVE GRILLE

Robert Dagenais, Laval, Canada, assignor to Dynaflair Corporation Ltd., Pointe Claire, Canada

Original No. 3,901,302, dated Aug. 26, 1975, Ser. No. 406,896, Oct. 16, 1973. Application for reissue June 1, 1976, Ser. No. 691,403

Int. Cl.[2] E05D *3/00, 7/00*

U.S. Cl. 160—183 8 Claims

1. A foldable closure structure comprising a foldable curtain having a plurality of panel members hingeably interconnected along opposed vertical edges, hinge members secured in spaced apart relationship to each said vertical edges, said hinge members each having panel attachment means for connection to a portion of a respective vertical edge of adjacent panel members, a connecting rod pivotally interconnecting said hinge members of adjacent vertical edges along a common axis, each said hinge member having an abutment surface lying substantially parallel to said connecting rod for abutment with a portion of said vertical edge of said panel member adjacent to the panel member to which said hinge member is connected to, each said hinge member further having a circular bore therein for receiving said connecting rod, said attachment means being a through bore disposed parallel to said circular bore, and a panel receiving opening in said member extending to said through bore for slidingly receiving a portion of said vertical edge of a respective panel member in said through bore, and suspension means for suspending said curtain in a frame opening.

Re. 29,309

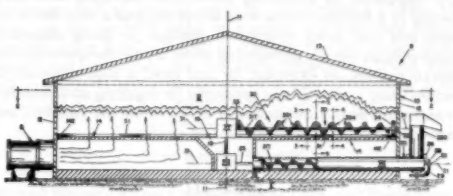
TRACTION ARRANGEMENT FOR ANGULARLY ROTATABLE SWEEP AUGER OF CIRCULATOR GRAIN BINS

William C. Patterson, 9364 North 45th St., Omaha, Nebr. 68112

Original No. 3,800,964, dated Apr. 2, 1974, Ser. No. 329,303, Feb. 5, 1973. Application for reissue Mar. 29, 1976, Ser. No. 671,250

Int. Cl.[2] B65G *65/46*

U.S. Cl. 214—17 DA 10 Claims



9. In a circulator type bin for storing grain or other flowable particulate solids and including upright sidewall means surrounding an upright vertical-axis and also a substantially horizontal bin floor intersecting said vertical-axis, said storage bin also including an elongate sweep auger that axially extends along a substantially horizontal auger-axis that radiates outwardly from the bin vertical-axis and is located immediately above the bin floor, said outwardly radiating sweep auger commencing at an inward end being pivotably associated with the bin so that the sweep auger including its outward end is adapted to rotate angularly about the bin vertical-axis, said sweep auger at pitch spacings along the auger-axis comprising helical flighting having a helical external edge spaced an intra-pitch given mean-radius from the auger-axis, the plurality of helical flighting pitches including an innermost pitch, an outermost pitch, and at least four consecutive medial pitches, the elongate sweep auger being revolvable about its auger-axis whereby particulate solids stored atop the bin floor are adapted to be circulated by the auger helical flighting inwardly toward the bin vertical-axis, the improvement of traction mechanism arrangement for the sweep auger and comprising:

A. A cog attached to a medial pitch of the sweep auger helical flighting, said cog having a free-edge located radially externally from the helical edge a finite cog-radius, said cog at its free-edge defining a medial rim of generally spiroid contour and submergible within the stored flowable particulate solids; and

B. A substantially horizontal annular roadway surrounding the bin vertical-axis and abuttably underlying the spiroid cog array medial rim whereby the axially revolvable and angu-

larly rotatable sweep auger is stably supported above the bin floor thereby assuring that a finite spatial gap exists between the bin floor and the cog-free medial flights of the sweep auger and also providing traction as the revolving distinct cog churns through said flowable solids matrix environment.

Re. 29,310

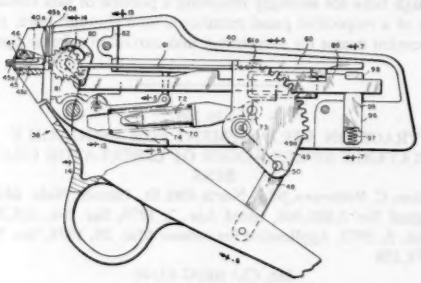
APPARATUS FOR DISPENSING FASTENERS

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original No. 3,797,722, dated Mar. 19, 1974, Ser. No. 276,118, July 28, 1972. Continuation-in-part of Ser. No. 169,413, Aug. 5, 1971, Pat. No. 3,759,435. Application for reissue Mar. 18, 1976, Ser. No. 668,095

Int. Cl.[2] B25C *1/00*

U.S. Cl. 227—67 **12 Claims**



7. Apparatus for dispensing attachment members, each being formed by a filament with a head at one end and a cross bar at the other end and being moved into position for being dispensed, comprising an ejector, an indexing wheel, a pawl for operation said indexing wheel, an extension for said pawl, a slide mounted for reciprocating motion in said apparatus for engaging said extension to move said pawl discontinuously to two distinctive positions, and means for moving said slide and said ejector.

Re. 29,311

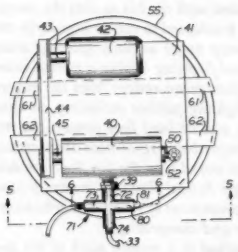
PAINTING APPARATUS

Erwin A. Ritter, 3662 Bendermeer Road, Cleveland Heights, Ohio 44118

Original No. 3,879,140, dated Apr. 22, 1975, Ser. No. 322,798, Jan. 11, 1973. Application for reissue June 1, 1976, Ser. No. 691,222

Int. Cl.[2] B44D *3/28*

U.S. Cl. 401—188 R **4 Claims**



3. An apparatus for use in applying a fluid to a surface comprising:

applicator means movable along the surface to apply the fluid directed thereto to the surface;

conduit means for directing the fluid to said applicator means, said conduit means comprising a hollow handle for supporting said applicator and through which the fluid is directed to said applicator, and a flexible hose fixedly connected to said hollow handle, means fixedly connecting said flexible hose to said hollow handle to communicate fluid from said flexible hose into said hollow handle; and

a telescoping handle connected to said hollow handle, means removably connecting said telescoping handle to said hollow handle to enable removal thereof from said hollow handle without disconnecting said flexible conduit therefrom, said telescoping handle including a pair of telescoping hollow tubular parts and said flexible hose extending through said telescoping tubular parts.

Re. 29,312

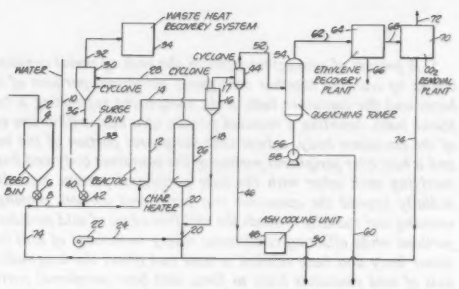
GASIFICATION OF CARBONACEOUS SOLIDS

George M. Mallan, Los Angeles, and Leslie E. Compton, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Original No. 3,846,096, dated Nov. 5, 1974, Ser. No. 299,157, Oct. 19, 1972. Continuation-in-part of Ser. No. 153,358, June 15, 1971, abandoned. Application for reissue Nov. 1, 1976, Ser. No. 737,279

Int. Cl.[2] C10J *3/16, 3/46*

U.S. Cl. 48—209 **32 Claims**



17. A process for producing gaseous hydrocarbons having from 1 to 7 carbon atoms from solid carbonaceous material comprising:

a. Forming a turbulent gaseous stream composed of carrier gas, water, char, and particulate carbonaceous solids, said solids having an individual maximum particle dimension of less than 1.0 inch, such that the solids and water are intimately admixed and entrained within the gaseous portion of the stream; said water being present in said stream in an amount which is at least 2.0 weight percent based upon the amount of carbonaceous solids in said stream; said carrier gas containing less than 1% by volume of oxygen;

b. Heating the components of said stream to a temperature ranging from between about 1200° F. and about 2500° F. in a pyrolysis zone for a predetermined residence time so that at least a portion of said carbonaceous solids are converted to gaseous hydrocarbons, containing from 1 to 7 carbon atoms;

c. Removing the product stream from the pyrolysis zone;

d. Recovering the gaseous hydrocarbon products.

Re. 29,313

PITTING CORROSION RESISTANT AUSTENITE STAINLESS STEEL

Tohru Muta; Hideo Abo, and Sakae Noguchi, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Original No. 3,854,937, dated Dec. 17, 1974, Ser. No. 207,021, Dec. 13, 1971. Application for reissue Nov. 8, 1976, Ser. No. 739,542

Claims priority, application Japan, Dec. 14, 1970, 45-110594

Int. Cl.[2] C22C *38/44, 38/58*

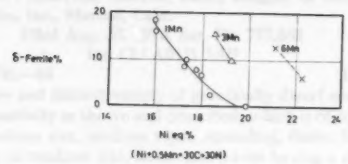
U.S. Cl. 75—128 A **1 Claim**

1. A pitting corrosion resistant austenite stainless steel consisting essentially of

not more than 0.08% by weight of carbon,

silicon in an amount not exceeding 4.0% by weight,

manganese in an amount not exceeding 5.0% by weight,
phosphorus in an amount not exceeding 0.04% by weight,
sulfur in an amount not exceeding 0.03% by weight,
10 to 18% by weight of nickel,
23 to 30% by weight of chromium,



0.30 to 0.45% by weight of nitrogen, and
0.1 to 4.0% by weight of molybdenum,
the balance being iron and unavoidable impurities, said steel satisfying the condition of Ni % + 30 (C % + N %) ≧ 20%.

Re. 29,314

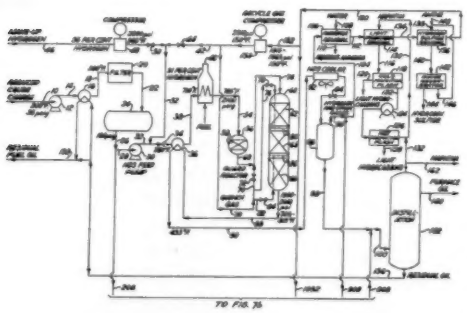
ASPHALTENE HYDRODESULFURIZATION WITH SMALL CATALYST PARTICLES IN A PARALLEL REACTOR SYSTEM

Edgar Carlson, deceased, late of Allison Park, Pa., by Gulf Research & Development Company, Pittsburgh, Pa.; Alfred M. Henke, Springdale, Pa.; William R. Lehrian, Verona, Pa.; Joel D. McKinney, Pittsburgh, Pa., and Kirk J. Metzger, Verona, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,563,886, dated Feb. 16, 1971, Ser. No. 770,725, Oct. 25, 1968. Application for reissue Sept. 8, 1976, Ser. No. 721,418

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **17 Claims**



1. A process for the hydrodesulfurization of a crude oil or a reduced crude oil containing the asphaltene fraction of the crude comprising passing said oil together with hydrogen through a plurality of reactors arranged in parallel, each of said reactors containing a series of compact beds of catalyst particles comprising a Group VI metal and Group VIII metal on alumina, the particles in said compact catalyst beds being between about 1/20 and 1/40 inch in diameter, [and] the hydrogen partial pressure in said plurality of compact parallel beds being [about] 1,000 to 5,000 pounds per square inch *and a throughput of at least 127 volumes of oil per volume of catalyst is continued for at least 10 days.*

Re. 29,315

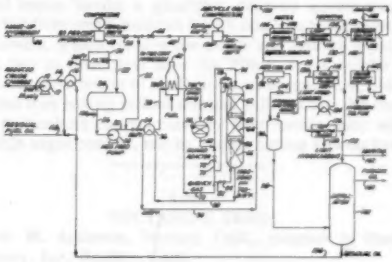
ASPHALTENE HYDRODESULFURIZATION WITH SMALL CATALYST PARTICLES UTILIZING A HYDROGEN QUENCH FOR THE REACTION

Edgar Carlson, deceased, late of Allison Park, Pa.; by Gulf Science and Technology Company, Pittsburgh, Pa.; Alfred M. Henke, Springdale, Pa.; William R. Lehrian, Pittsburgh, Pa.; Joel D. McKinney, Pittsburgh, Pa., and Kirk J. Metzger, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,562,800, dated Feb. 9, 1971, Ser. No. 770,625, Oct. 25, 1968. Application for reissue Sept. 8, 1976, Ser. No. 721,419

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **24 Claims**



1. A process for the hydrodesulfurization of a crude oil or a reduced crude containing the asphaltene fraction of the crude comprising passing a mixture of hydrogen and said oil through a compact bed of catalyst particles comprising a Group VI metal and Group VIII metal on alumina, the hydrogen partial pressure being [about] 1000 to 5000 pounds per square inch, [and] said particles in said bed being between 1/20 and 1/40 inch in diameter *and a throughput of at least 127 volumes of oil per volume of catalyst is continued for at least 10 days.*

Re. 29,316

CROSS-LINKED RESINS

Michael Bargain; André Combet, both of Lyon, and Pierre Grosjean, Sainte-Foyte-les-Lyon, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Original No. 3,562,223, dated Feb. 9, 1971, Ser. No. 743,025, July 8, 1968. Application for reissue Dec. 1, 1972, Ser. No. 311,138

Claims priority, application France, July 13, 1967, 67.114381

Int. Cl.² C08G *73/12*

U.S. Cl. 260—30.2 **21 Claims**

1. A cross-linked resin obtained by heating at 100° C. to 350° C. an unsaturated bis-imide selected from the group consisting of maleic N,N′-ethylene-bis-imide, maleic N,N′-hexamethylene-bis-imide, maleic N,N′-metaphenylene-bis-imide, maleic N,N′-paraphenylene-bis-imide, maleic N,N′-4,4′-diphenylmethane-bis-imide, maleic N,N′-4,4′-diphenylether-bis-imide, maleic N,N′-4,4′-diphenylsulphone-bis-imide, maleic N,N′-4,4′-dicyclohexylmethane-bis-imide, maleic N,N′-α,α′-4,4′-dimethylenecyclohexane-bis-imide, maleic N,N′-metaxylylene-bis-imide and maleic N,N′-4,4′-diphenylcyclohexane-bis-imide with a diamine selected from the group consisting of 4,4′-diaminodicyclohexylmethane, 1,4-diaminocyclohexane, 2,6-diaminopyridine, metaphenylenediamine, paraphenylenediamine, 4,4′-diaminadiphenylmethane, 2,2-bis-(4-aminophenyl)-propane, benzidine, 4,4′-diaminophenyl oxide, 4,4′-diaminodiphenyl sulphide, 4,4′-diaminodiphenyl-sulphone, bis-(4-aminophenyl)diphenylsilane, bis-(4-aminophenyl)methylphosphine oxide, bis-(3-aminophenyl)methylphosphine oxide, bis-(4-aminophenyl)phenylphosphine oxide, bis-(4-aminophenyl)phenylamine, 1,5-diamino-naphthalene, metaxylylenediamine, paraxylene diamine, 1,1-bis-(paraaminophenyl)phthalene, 1,1-bis-(4-aminophenyl)cyclohexane, 1,1-bis-(4-amino-3-methylphenyl)cyclohexane and hexamethylenediamine at a ratio of bis-imide to diamine of from 1.2:1 to 50:1.

PLANT PATENTS

GRANTED JULY 19, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,078
DWARF NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Stribling's Nurseries, Inc., Merced, Calif.

Filed Aug. 25, 1976, Ser. No. 717,861
Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of genetically dwarf nectarine tree, substantially as shown and described, which is of comparatively medium size, medium vigor, spreading, dense, foliated with large to medium size, lanceolate leaves having a crenate margin, flowering mid-season with large flowers, and a productive and regular bearer of early ripening, medium size, symmetrical, globose, freestone fruit having yellow skin substantially overspread with red, and yellow flesh; the variety being characterized by fruit which ripens about two weeks earlier than the Golden Prolific nectarine, and which fruit has a red exterior color brighter than said Golden Prolific nectarine and resembling the May Grand nectarine in such respect.

4,079
DWARF NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Aug. 25, 1976, Ser. No. 717,862
Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of genetically dwarf nectarine tree, substantially as illustrated and described, which has short internodes, is comparatively large, vigorous, upright, spreading, dense, foliated with large, lanceolate leaves having a glandular, crenate margin, blooms with large, pink flowers, and a regular and very productive bearer of large, uniform, symmetrical, globose, clingstone fruit having yellow skin substantially overspread with red, and yellow flesh; the tree, because of such short internodes, being only about 30 percent as high as the Red Grand nectarine, although the fruit, in size and appearance, resembles that of the latter but with much less red around the pit.

4,080
APRICOT TREE

Frederic W. Anderson, Merced, Calif., assignor to Stark Bro's Nurseries and Orchards Co., Louisiana, Mo.

Filed Sept. 8, 1976, Ser. No. 721,541
Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree, substantially as illustrated and described, which is large, vigorous, spreading, with a trunk and branches of medium size and medium texture, foliated with medium size, medium thick, cordate, abruptly pointed leaves having a glandular, coarsely serrate margin, flowering from small, medium length conic buds with medium size flowers, which have white petals and reddish sepals, in bloom two to three days after the Tilton, and a regular and very productive bearer of small, uniform, symmetrical, oblong, freestone fruit having yellow skin and yellow flesh; the variety being particularly characterized by fruit having juice with a very high sugar content, and by a stone having a sweet kernel.

4,081
NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Sept. 8, 1976, Ser. No. 721,542
Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is of medium size, medium vigor, spreading, foliated with large, acutely pointed, lanceolate leaves which are smooth and have a crenate margin, a regular and productive bearer of large to medium size, uniform, symmetrical, globose, freestone fruit having yellow skin substantially overspread with red, yellow flesh, and a red pit cavity with the red streaked into the flesh, and the stone having a sweet kernel; the variety being particularly characterized by fruit which resembles the pollen parent, May Grand, in its attractive red skin and juicy flesh, and resembles the seed parent, Red Free, in most other respects, but ripens about one week later than said Red Free.

PATENTS

GRANTED JULY 19, 1977

ERRATA

For CLASS	See PATENT NO.
428–576	4,035,892
091–005	4,036,106
119–051	4,036,189
188–282	4,036,319
235–61.11 E	4,036,430
235–092	4,036,431
294–005.5	4,036,454
242–201	4,036,458
415–090	4,036,584
428–608	4,036,599
428–555	4,036,600
428–663	4,036,601
428–621	4,036,602
136–089 C	4,036,645
176–087	4,036,700
250–199	4,036,762
250–214 C	4,036,763
264–256	4,036,839
358–113	4,037,048
235–069	4,037,084
250–527	4,037,112
361–020	4,037,138
361–058	4,037,139
361–056	4,037,140
361–182	4,037,141
361–433	4,037,142
340–237 S	4,037,206
364–200	4,037,207
364–900	4,037,208
364–200	4,037,209
364–900	4,037,210
364–200	4,037,211
364–200	4,037,212
364–200	4,037,213
364–200	4,037,214
364–200	4,037,215
364–900	4,037,216

PATENTS

GRANTED JULY 19, 1977

ERRATA

PATENTS

GRANTED JULY 19, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

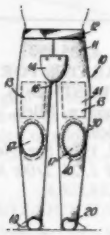
GENERAL AND MECHANICAL

4,035,844

NOVEL TROUSER-LIKE ARTICLE OF CLOTHING

James W. Atack, 4230 Patten Cresent; Howie Triano, 6776 McMicking Street, and Peter Zoretich, 6711 McMicking Street, all of Niagara Falls, Ontario, Canada

Filed Nov. 10, 1971, Ser. No. 197,311
Claims priority, application Canada, Apr. 27, 1971, 111457
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **19 Claims**



1. In a trouser-like article of clothing formed of a material which is elastically stretchable both in the longitudinal and transverse directions, the provision of a frontal, openable and reclosable crotch pocket on the exterior surface of the trouser, adapted, at the will of the wearer, to retain a crotch protector cup therein, and means for opening and reclosing such pocket.

4,035,845

PROTECTIVE FLIGHT HELMET

John R. Hochwalt, Green County, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 724,050
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—6 **6 Claims**

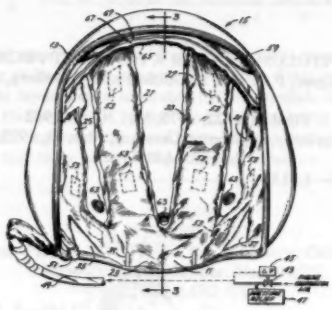
1. A helmet for flight personnel, comprising: a rigid energy absorbing liner member, adapted to conform to the head of the wearer; a penetration resistant mid-liner member covering the energy absorbing liner member; a helmet cover over said mid-liner member; said cover being made of a substantially non-stretchable flexible material; a chin strap secured to said helmet cover; a visor member; means for supporting said visor member on said helmet cover; a pair of communication earcups; means for securing said earcups to the internal surface of said helmet cover; an impact protection pad; means for securing the impact protection pad to the helmet cover at a position adapted to be placed adjacent the nape area of the wearer.

4,035,846

INFLATABLE PRESSURE COMPENSATED HELMET STABILIZATION SYSTEM

Craig S. Jencks, Fountainville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1976, Ser. No. 715,039
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—413 **5 Claims**



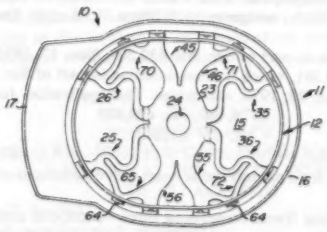
1. A helmet stabilization system, comprising:
a helmet shell;
a chin strap secured at each end to said shell for pressing the head of the wearer in said shell;
an inflatable member disposed within said shell for opposing the forces imposed on the head of the wearer by said chin strap;
a first plurality of fasteners releasably fastening said member to within said shell;
a source of pressurized fluid; and
pressure compensating valve means operatively connected between said source and said member for passing the pressurized fluid therethrough according to the variation from a preset value of the pressure difference between that of said member and the ambient pressure.

4,035,847

SUSPENSION FOR A HARD HAT

Jack M. Prince, West Reading, Pa., and Dai Chung Yang, Wilmington, Del., assignors to The Fibre-Metal Products Co., Concordville, Pa.

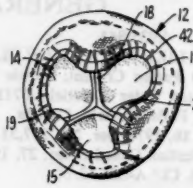
Filed July 2, 1976, Ser. No. 702,105
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—416 **7 Claims**



1. A suspension for a hard hat comprising a central portion for resting on a wearer's head, a plurality of more yieldably extensile legs extending outwardly and arcuately downwardly

from said central portion for connection to a hat shell, a plurality of less yieldably extensile legs extending outwardly and arcuately downwardly from said central portion in angularly spaced relation with each other and said more yieldably extensile legs for connection to the hat shell, said more yieldably extensile legs being configured for distension before said less yieldably extensile legs on relative downward shell movement for relatively gradual force transmission to a wearer's head, and a plurality of relatively flexible headband connection legs carried by said central portion and depending freely intermediate said more and less yieldably extensile legs to terminate in free ends for connection to a headband.

b. a fabric cover covering at least the exterior surface of the frame.



4,035,848

HIP CAPITULUM CAP FOR A HIP JOINT PROSTHESIS

Heinz Wagner, P.O. Box 22, Altdorf near Nurnberg, Germany (8503)

Filed Mar. 22, 1976, Ser. No. 668,962
Claims priority, application Germany, Mar. 21, 1975, 2512407
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.913 5 Claims

1. A hip capitulum cap for a hip joint prosthesis for cement fixation to a thigh bone comprising a cap member having inner and outer surfaces and shaped substantially in the form of half a hollow sphere, at least one surface discontinuity on the inner surface of said cap member and an opening through the wall of said cap member extending between the inner and outer surfaces thereof, wherein said cap member has a vertex, said opening being a radial boring located at said vertex and being enlarged at its outer end.

4,035,849

HEART VALVE STENT AND PROCESS FOR PREPARING A STENTED HEART VALVE PROSTHESIS

William W. Angell, San Jose, Calif., and David L. Yoon, East Lansing, Mich., assignors to William W. Angell, San Jose, Calif.

Continuation-in-part of Ser. No. 632,309, Nov. 17, 1975, Pat. No. 3,983,581, which is a continuation-in-part of Ser. No. 536,300, Jan. 20, 1975, abandoned. This application June 25, 1976, Ser. No. 699,888
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 17 Claims

1. A stent for a natural tissue heart valve prosthesis comprising:

a. an annular frame comprising three ventricular struts, two of which are biased radially inwardly and the third of which is biased radially inwardly but to a lesser degree than the other two or is generally parallel to the frame axis and three ventricularly relieved portions respectively interconnecting said struts; and

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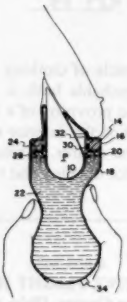
4,035,850

METHOD AND APPARATUS FOR INSERTING SOFT PROSTHESIS

Thomas A. Cresswall, Saginaw, Mich., assignor to Thomas A. Cresswall, Saginaw, Mich.

Filed Oct. 7, 1976, Ser. No. 730,661
Int. Cl.[2] A61F *1/24, 1/00*; A61B *17/00*
U.S. Cl. 3—36 8 Claims



3. Apparatus for inserting a prosthesis, such as a soft, pliable mammary prosthesis or the like, into a human body via an incision comprising a first open mouthed fluid container, an open mouthed inner bag of flexible fluid impervious material received within said first container, sealing means sealing said bag to said first container around the periphery of the mouth, said bag and said first container defining an enclosed fluid chamber surrounding the exterior of said bag, and a prosthesis located within the interior of said bag and adapted to pass through the mouths of said first container and said bag when a charge of fluid contained in said chamber is compressed to evert said bag through its mouth to carry the prosthesis outwardly through the mouth of said first chamber.

4,035,851

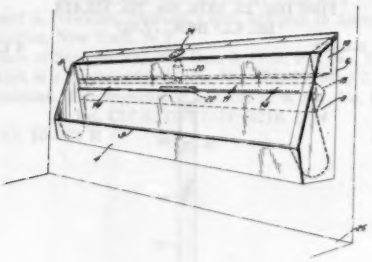
URINALS

Harold G. Wyeth, Ringwood, and John L. T. B. Gmach, Fordingbridge, both of England, assignors to Ashford Marine (J. L. Gmach) Limited, Fordingbridge, England

Filed May 7, 1976, Ser. No. 684,316
Claims priority, application United Kingdom, May 8, 1975, 19497/75
Int. Cl.[2] E03D *13/00*
U.S. Cl. 4—99 11 Claims

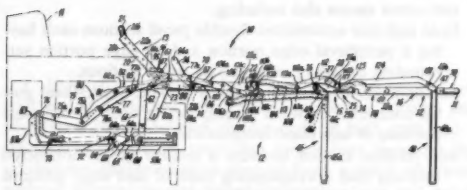
1. A urinal having a generally vertical face with a trough at its lower end, said face being formed along the upper part thereof with a shaped horizontal recess, said recess being perforated with a horizontal row of holes, a reservoir adapted for connection to a water supply and communicating with said recess through said holes such that flushing water can pass from said reservoir through said holes to said horizontal recess

and thence to said face, said reservoir extending along said urinal generally to the rear of said recess, whereby water from



said reservoir emerging through said holes flows over the lower surface of said recess before passing to the face of said urinal to effect flushing of said face and said trough.

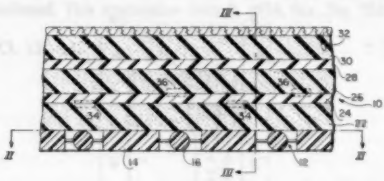
4,035,852
PULL OUT SOFA BED
Izchak Cycowicz, Brooklyn, N.Y., and Glenn G. Gill, Bayonne, N.J., assignors to Mohasco Corporation, Amsterdam, N.Y.
Filed Oct. 8, 1976, Ser. No. 730,857
Int. Cl.[2] A47C *17/14*
U.S. Cl. 5—13 **25 Claims**



1. A folding bed comprising a chassis, a main lever pivoted to said chassis, said main lever having an arm extending upwardly from said pivot, in the open position of said bed, linkage connecting said chassis to the upwardly extending arm of said main lever, said bed having a main section, means to pivotally connect the rear end of said main section of said linkage, a central section pivoted to the forward end of said main section, a foot section pivoted to the forward end of said central section, a main bell crank pivoted to said main section and having an arm extending rearwardly, in the open position of said bed, and pivoted to said linkage, a slotted lock link pivoted to said main bell crank, said slotted lock link having a radial slot, a secondary bell crank piovted to said main bed section, a pin on said secondary bell crank, slidably received in said slot in said slotted lock link, a main lock link pivoted to said central section and having an arm projecting rearwardly, in the open position of said bed, a lock sequence link connecting said arm of said main lock link to said secondary bell crank, said main lock link having an arm extending forwardly of its pivotal connection to said central section, in the open position of said bed, and a foot section lock link connecting said forwardly extending arm of said main lock link to said foot section.

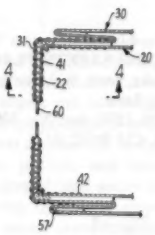
4,035,853
MATTRESS CONSTRUCTION FOR USE IN HOSPITALS AND THE LIKE
Fenton H. Platter, 609 Elwood St., Cumberland, Md. 21502
Filed Mar. 9, 1976, Ser. No. 665,183
Int. Cl.[2] A47C *27/22*; A61G *7/02*
U.S. Cl. 5—91 **7 Claims**

1. A mattress construction for hospitals and the like comprising a plurality of separate layers of a foam material and a further layer comprising a plurality of transversely extending, alternately disposed flat members and rounded members, and means for joining said flat members and rounded members to form a flexible assembly, said flat members including a flat upper surface and said rounded members including a rounded upper surface, said flat members comprising slats and said



rounded members comprising dowels, said construction including at least three separate layers of a foam material, said separate layers being separated by intermediate layers of reduced thickness, said further layer, in use, being located beneath said separate layers and being secured to the bottommost one of said three separate layers by an adhesive.

4,035,854
MATTRESS COVER
Marilynn Pardee, 1048 Pacific, San Francisco, Calif. 94133
Filed Oct. 22, 1975, Ser. No. 624,722
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—334 C **1 Claim**



1. A mattress cover comprising a fitted sheet for snugly covering the top, side and foot and head surfaces of said mattress,

a plain sheet for covering said fitted sheet, said plain sheet being wider than said fitted sheet; and

connecting means permanently attaching an edge of said plain sheet to the edge of said fitted sheet along a C-shaped line described generally by the lower edge of said foot surface and by the lower edges of a portion of said side surfaces of said mattress adjacent said foot surface, whereby said plain sheet folds along a line extending from the end of said C-shaped line to the upper corner of the foot of said mattress, said mattress cover further comprising as elastic band in said fitted sheet extending along a portion of said C-shaped line.

4,035,855
CAMPING PACK
Sung Bong Kim, 10411 Fyfe Court, Fairfax, Va. 22030
Filed Feb. 13, 1976, Ser. No. 657,970
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—343 **16 Claims**

1. A camping pack comprising:

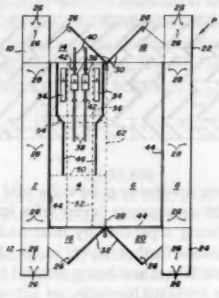
a. a tent assembly,

b. a sleeping bag assembly,

c. a carrying kit assembly,

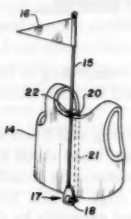
d. each of said assemblies is being joined to each other,

e. said assemblies forming in non-assembled position a substantially planar, sheet-like article having four panels,
f. each of said panels having at each end thereof a flap,
g. said pack including fastening means for securing said flaps and panels together into one or the other of said assemblies,



h. said four panels being rectangular and arranged in side-by-side relation there being two central panels and two outer panels and said outer panels being on either side of said central panels.
i. and said central panels comprising substantially the whole of said carrying kit assembly.

4,035,856
WATER SKI SAFETY FLAG
Gary R. Oberg, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed July 29, 1976, Ser. No. 709,634
Int. Cl.² B63C 9/21
U.S. Cl. 9—313 **4 Claims**

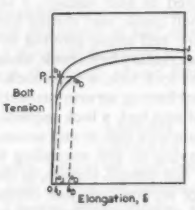


1. Visual marker means for attachment to the floatation gear of a water skier and comprising:
a. staff means having a flag member secured to the upper end thereof and attachment means secured to the lower end thereof, and adjustable belt means for releasably coupling said staff and said attachment means to the floatation gear of a water skier;
b. said attachment means comprising a staff securing buckle for retaining said staff therein, said buckle having slots formed therein for releasably and adjustably receiving the lower end of said belt means in firm engagement therewith; and
c. said adjustable belt means having a bore formed therein at the upper end thereof for receiving said staff in slidable engagement therewith, the arrangement being such that said staff and said belt means form a closed loop for the releasable coupling of said visual marker means to the floatation gear of a water skier.

4,035,857
DIVERS BUOYANCY VEST
Ronald D. Briley, Wheeling, and Vernon G. Pedersen, Chicago, both of Ill., assignors to Dacor Corporation, Northfield, Ill.
Filed Dec. 23, 1974, Ser. No. 535,418
Int. Cl.² B63C 11/02
U.S. Cl. 9—342 **4 Claims**

1. A floatation device of the type including an inflatable bladder, comprising
flexible cover means enclosing said bladder,
said cover means including a resilient section of open weave resilient fabric material for exerting a compressive force on said bladder, and
said cover means further including nonresilient means for limiting the expansion of said bladder to a predetermined extent,
said cover means also including
front and rear nonresilient flexible panel sections each having a peripheral edge portion and an edge portion surrounding a neck opening in said panel sections,
said nonresilient means includes a flexible, nonresilient gusset connected between corresponding ones of said edge portions of said panel sections and
said resilient section includes a reslient gusset connected between said corresponding ones of said edge portions externally of said non-resilient gusset.

4,035,858
PROCESS FOR THE PREUSE WORK-HARDENING OF BOLTS
Norman C. Dahl, Lexington, Mass.
Filed Mar. 8, 1976, Ser. No. 664,574
Int. Cl.² B21K 1/44
U.S. Cl. 10—27 H **1 Claim**



1. In a method for manufacturing bolts of a given grade and size having a minimum proof load which method comprises the steps of forming blanks into bolts having heads and shanks, threading said shanks, and heat treating the formed bolts, wherein the improvement comprises work hardening each bolt by applying and subsequently removing a tensile force of uniform magnitude somewhat above the minimum proof load for the given grade and size of bolt, so that all bolts so treated will have the same yield point and the torque-rotation curve for each bolt will have a discontinuity in slope at this common yield point.

4,035,859

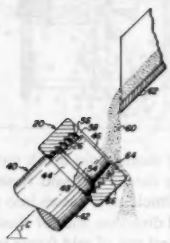
APPARATUS FOR MAKING SELF-LOCKING INTERNALLY THREADED FASTENERS WITH RING-LIKE LOCKING ELEMENTS

Richard S. Newnom, Tujunga, Calif., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 637,989, Dec. 5, 1975, Pat. No. 3,975,787, which is a continuation of Ser. No. 466,499, May 2, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,480

Int. Cl.[2] B21D *53/24*; B21K *1/64*

U.S. Cl. 10—72 R 9 Claims



1. Apparatus for converting a nut having an imperforate wall providing the nut with external wrenching surfaces and an internal thread-defining surface open at both ends into a self-locking nut of the prevailing torque type in which the self-locking characteristic is derived from a patch of plastic material adhered to said thread-defining surface, said patch being of a predetermined circumferential extent which is greater than 180° and further being axially limited so as to be spaced from both axial ends of said thread-defining surface, said apparatus comprising:

a pin having a cavity-forming portion having a circumferential extent which is at least as great as said predetermined circumferential extent;

means for seating the nut, either end first, upon said pin such that the pin enters one of the open ends of the thread-defining surface so that the pin is received within the thread-defining surface of the nut with said portion of the pin and a portion of the thread-defining surface of the nut establishing a cavity having an opening at the other open end of the thread-defining surface of the nut, the cavity further having a circumferential extent at least as great as said predetermined circumferential extent;

means for thereupon inserting a quantity of powder of said plastic material through said opening into said cavity and upon a portion of the thread-defining surface of the nut, to establish an initial deposit having at least predominantly a circumferential extent which is less than 180° and which is significantly less than said predetermined circumferential extent;

means for subsequently, and while said nut remains seated upon said pin, re-distributing plastic powder within the cavity to increase the circumferential extent of the powder within the cavity to increase the circumferential extent of the powder to establish a final deposit of plastic powder substantially having said predetermined circumferential extent; and

means for thereupon heating the nut to fuse the final deposit and establish said patch.

4,035,860

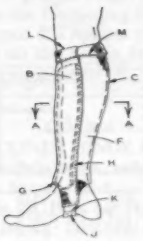
PROTECTIVE GAITER

Albert Lee Fugere, 4901 - 17th Ave. S., Seattle, Wash. 98108, and Michael Joseph Kelly, 808 NE. 82nd, Seattle, Wash. 98115

Division of Ser. No. 552,551, Feb. 24, 1975, which is a continuation-in-part of Ser. No. 461,156, April 15, 1974, abandoned. This application July 9, 1976, Ser. No. 703,903

Int. Cl.[2] A43D *9/00*

U.S. Cl. 12—142 W 7 Claims



1. A method of manufacturing a protective gaiter, wherein said gaiter includes first and second substantially identical fabric sections, each of said fabric sections having, in outline, upper and lower edges, and two longitudinal edges extending therebetween, the lower edge of said first and second fabric sections having first and second straight edge portions and an intermediate edge portion, said intermediate edge portion being concavely shaped, said gaiter further including a third fabric section having in outline, upper and lower edges, and two longitudinal edges extending therebetween, an energy-absorbing pad, and an elastic strap having two ends, the method comprising the steps of:

aligning said first, second and third fabric sections such that their respective upper edges are adjacent each other and terminate in a common plane, and such that one of their respective longitudinal edges lie adjacent, each other and terminate in a common plane, thereby defining a first gaiter longitudinal edge;

securing together said first, second and third fabric sections along a line adjacent said first gaiter longitudinal edge;

securing together said first and second fabric sections along a line adjacent the lower edges thereof, including the step of securing one end of said elastic strip between adjacent first straight edge portions of said first and second fabric sections, and securing the other end of said elastic strip between adjacent second straight edge portions of said first and second fabric sections;

aligning the other longitudinal edge of each of said first, second and third fabric sections, thereby defining a second gaiter longitudinal edge;

securing together said first, second and third fabric sections along a line adjacent said second gaiter longitudinal edge, said first and second fabric sections, thereby defining a pocket;

inserting said protective pad into said pocket; and

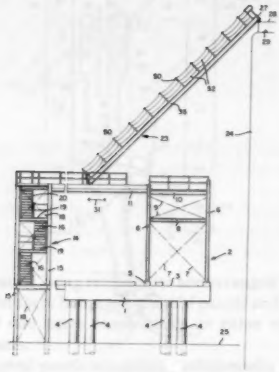
securing together said first and second fabric sections along a line adjacent the upper edges thereof, thereby defining a partial gaiter upper edge and completely enclosing said protective pad in said pocket.

4,035,861

GANGWAY SYSTEM

George S. Edge, Fanwood, N.J., assignor to Amerada Hess Corporation, New York, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,809
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—71.1 10 Claims



1. A structure for providing a connecting link between a vessel and a docking area adjacent to which the vessel is adapted to be moved for loading and unloading comprising in combination:

a movable gangway structure of selectively fixed operative length from one end of the gangway structure to the other end thereof,

means to support one end of the gangway structure on the vessel in any position of movement of the gangway structure with respect to the vessel,

a longitudinal gangway supporting member disposed at the docking area at a height above the mean low water level,

carriage means disposed for movement back and forth along the longitudinal member and supporting the other end of the gangway structure on the longitudinal member in any position of movement of the gangway structure with respect to the longitudinal member and at any corresponding position of movement of the carriage means along the longitudinal member, and

conjoint vertical and horizontal articulation connection means operatively interposed between said other end of the gangway struxture and the carriage means to preclude freely and continuously the tortional twisting of the gangway structure in any position of movement thereof with respect to the carriage means and at any corresponding position of movement of the carriage means along the longitudinal member.

4,035,862

IN-OUT AUTOMATIC VEHICLE WASHING APPARATUS

George E. Ennis, 765 Christy Road, Sharon, Pa. 16146; George Thomas Ennis, 13955 Tahiti Way, Marina Del Ray, Calif. 90291, and John W. Nugent, 72 Broadway Road, Masury, Ohio 44438

Filed June 29, 1976, Ser. No. 700,815
Int. Cl.[2] B60S *13/06*
U.S. Cl. 15—53 AB 12 Claims

1. An automatic vehicle washing apparatus comprising:

a. a stationary frame;

b. a plurality of brushes mounted on said frame,

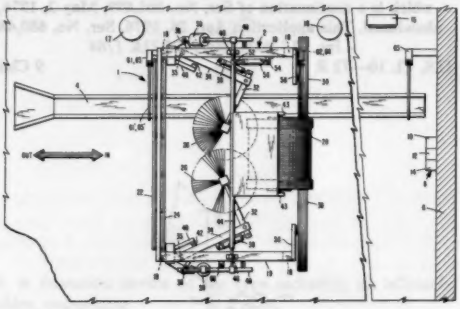
c. means for rotating each said brush;

d. means for moving certain of said brushes between an operative vehicle washing position and an inoperative retracted position;

e. means for applying detergent to the vehicle;

f. means for applying rinse to the vehicle; and

g. electrical control means for controlling the operation of



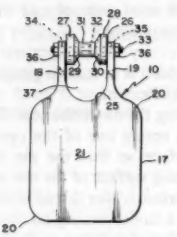
said brush rotating means, said brush moving means, said detergent applying means and said rinse applying means for washing the vehicle as it passes into and through said frame in a forward direction and for rinsing the vehicle as it passes through and out of said frame in a reverse direction.

4,035,863

SWIMMING POOL BRUSH GUIDE

Albert Fischer, 4835 Oakway Drive, San Antonio, Tex. 78228

Filed Dec. 13, 1976, Ser. No. 750,010
Int. Cl.[2] A46B *17/02;* E04H *3/20*
U.S. Cl. 15—160 10 Claims



1. In combination with a swimming pool brush including a long handle adapted to clean the side wall of a swimming pool, a swimming pool brush guide comprising

a base plate,

first and second laterally spaced and forwardly extending arms integrally formed on said base plate,

a roller rotatably mounted intermediate said first and second arms,

said handle of said brush adapted to be carried intermediate said arms and said roller with said brush extending downwardly,

said brush guide adapted to be positioned adjacent said swimming pool with said roller extending at least slightly inwardly of said side wall whereby a user, standing upon said base plate, grasps said handle, forces the same outwardly against said roller, and said brush is forced inwardly against the side wall of said pool.

4,035,864

LOCKABLE CASTER, MORE PARTICULARLY SWIVEL CASTER

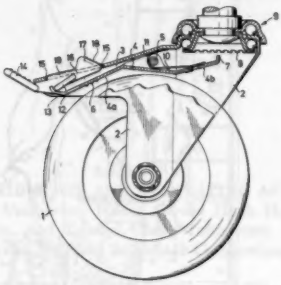
Klaus Dieter Schröder, Wermelskirchen, Rheinland, Germany, assignor to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie, Wermelskirchen, Rheinland, Germany

Filed July 15, 1975, Ser. No. 596,046

Claims priority, application Germany, Nov. 30, 1974, 7439939[U]

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—35 R 8 Claims



1. A lockable caster, which may be a swivel caster, having a running wheel rotatably mounted in a caster-fork and a locking device for locking the running wheel to prevent it from running and/or to prevent its caster-fork from swiveling, including locking means to engage with and lock the wheel and/or with a fixed ball bearing shell of the caster-fork to provide swivel locking, said locking device comprising an expanding toggle which is disposed in the cavity of the caster-fork, and which takes the form of a foot-operated control lever, and is pivotally mounted in a socket located in the hollow of the caster-fork below the fork back, the expanding toggle having a guide lug and the caster-fork having a guide slot, the guide lug being guided in the guide slot, the expanding toggle the guide lug and the control lever forming an unitary element pivotally mounted in said socket, characterized in that the guide slot is disposed in the rear portion of the caster-fork, and the guide lug takes the form of a resettling cam which in the locking position extends out of the guide slot to form a foot-operated cam provided for tilting the expanding toggle back into its release position.

4,035,865

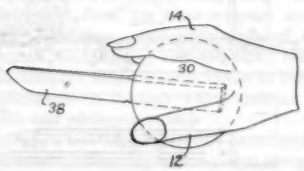
IMPLEMENTS USABLE BY PERSONS AFFLICTED WITH ARTHRITIS

Lucy Theresa McRae, and Brian Joseph McRae, both of 28059 Kendallwood Road, Farmington Hills, Mich. 48024

Filed Jan. 19, 1976, Ser. No. 650,127

Int. Cl.[2] B25G *1/00*

U.S. Cl. 16—114 R 2 Claims



1. A hand-manipulatable implement for use by persons afflicted with arthritis in their hands: said implement comprising a functioning device to be operated, and a handle to be held in the palm area of a person's hand:

said functioning device being selected from the class comprising an eating knife, fork, toothbrush, hair comb, writing pen, pencil, medicine bottle cover, and telephone dialing aid;

said handle being configured as a sphere having a diameter ranging between 1¼ and 2 inches, whereby the sphere can be frictionally retained against the average person's palm and thumb without bending internal joints within the fingers;

the functioning device and handle being separately formed; said spherical handle having a socket opening extending inwardly from its outer surface along a sphere radius; said functioning device having a shank adapted to extend into the defined socket to form a rigid force-transmitting connection between the functioning device and handle; the sphere being formed of a resilient material, and the socket opening being a slit that can be deformed to conform to varying shank cross sections.

4,035,866

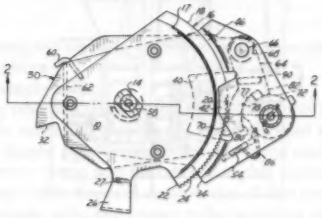
SEAT RECLINER HINGE ASSEMBLY

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Apr. 23, 1976, Ser. No. 679,756

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—146 18 Claims



1. A seat recliner hinge comprising

a pair of plates, pivot means interconnecting said plates, said plates and pivot means being operable as a part of means hinging together a seat and seat back connected to said plates,

a first one of said plates having a pair of confronting abutments thereon spaced circumferentially about the axis of said pivot means at an angular spacing to provide the intended pivotal movement of said seat back from full reclining position to a forwardly displaced loading position,

the second one of said plates having an abutment thereon movable between the abutments on said first plate to limit pivotal movement between said plates to correspond to movement between full reclining and forwardly displaced loading positions of the seat back,

one of said plates having an arcuate edge portion concentric with the axis of said pivot means and of an angular extent substantially corresponding to the relative pivotal movement provided between said plates, a part of said edge portion having a multiplicity of locking teeth thereon, the remainder of said edge portion having a smooth arcuate periphery,

a locking pawl movably carried by the other of said plates and having a toothed portion,

resilient means biasing said pawl in a direction to cause its toothed portion to bear against said arcuate edge portion,

the smooth and toothed parts of the edge portion of said one plate and the toothed portion of said pawl being of such angular extent and location that during relative pivotal movement between said plates corresponding to move-

ment of a seat back between full forwardly displaced loading position and intermediate erect position, the teeth on the toothed end portion of said pawl engage the smooth arcuate periphery of the said edge portion, and that during relative pivotal movement between said plates corresponding to movement of the seat back between intermediate erect position and full reclining position the teeth on the toothed portion of said pawl are engageable with teeth on the toothed part of said arcuate edge portion to lock the plates against pivotal movement and so to lock a seat back connected to one of said plates in any selected intermediate reclining position.

4,035,867

APPARATUS FOR REMOVING THE NECK FROM A FOWL

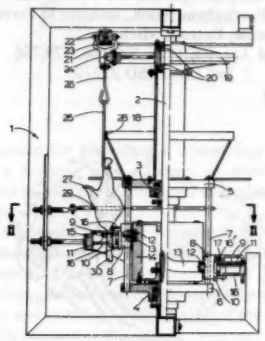
Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands

Filed Mar. 1, 1976, Ser. No. 662,928

Claims priority, application Netherlands, Mar. 5, 1975, 7502569

Int. Cl.[2] A22C *3/08*

U.S. Cl. 17—11 **4 Claims**



1. Apparatus for removing the neck of headless, plucked fowls hanging by the ankle joints from spaced hooks of an overhead conveyor, comprising a frame; a merry-go-round assembly on said frame including: a plurality of vertical slide bars regularly spaced about the circumference of the merry-go-round with the same spacing as the spacing of the hook of said conveyor; means for moving said slide bar along with said conveyor; a slide block reciprocably mounted on each said slide bar; means for sliding each said slide block up and down along said slide bar, each said slide block being provided with a forked clamping member laterally extending towards said conveyor, a pivotable arm connected to said clamping member for cooperating therewith the means for moving said arm towards and away from said clamping member in such manner that with the slide block in an upper position the arm is moved towards the clamping member thereby pressing the fowl's neck into said clamping member, so that the vertebrae of the neck are separated from the remaining part of the fowl's spinal column without damage to the fowl's skin; whereafter said slide block is moved downwards along said slide bar, so that said vertebrae together with the meat adhering thereto are at least partially pulled out of the skin of the neck through the opening previously provided by the removal of the fowl's head; and finally, with said slide block in a lower position, said arm is moved away from said clamping element thereby releasing the fowl; said slide blocks and said pivotable arms being provided with followers cooperating with stationary camming tracks attached to said frame, said camming tracks being so shaped that the movements of said slide blocks and said pivotable arms are executed in the desired sequential order.

4,035,868

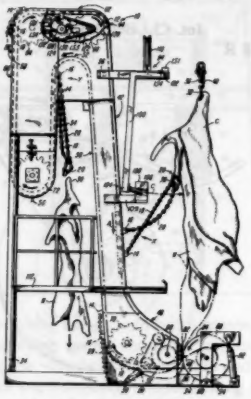
MEANS FOR HANDLING HIDES DURING AND AFTER HIDE-PULLING OPERATION

Patrick J. Gardner, 419 E. Maple, and Hugh T. Myers, Sr., 111 Bonita, both of Ottumwa, Iowa 52501

Filed Sept. 17, 1975, Ser. No. 614,140

Int. Cl.[2] A22B *5/16*

U.S. Cl. 17—21 **20 Claims**



1. A device for advancing a hide during a hide pulling operation, and thereafter lifting and releasing the pulled hide, which comprises

a pair of chains, one of which terminates in a hide-receptive slip loop and the other of which is secured to the slip loop and is operable to loosen same for releasing a hide engaged thereby; and

means for advancing said chains along a predetermined, closed path downwardly during the hide-pulling operation, thence upwardly for elevating the pulled hide to a position sufficient for freely suspending the hide and for thereafter actuating the other of said chains to loosen the slip loop and release the suspended hide.

4,035,869

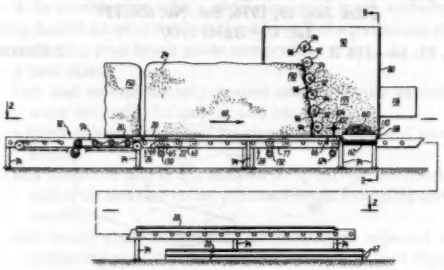
METHOD FOR THE CONTINUOUS FEEDING OF PALLETIZED FIBER MATERIALS

Lambert H. Wilkes; Gary L. Underbrink, both of College Station, Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton Incorporated, New York, N.Y.

Division of Ser. No. 439,486, Feb. 6, 1974, Pat. No. 3,897,018. This application Feb. 19, 1975, Ser. No. 550,940

Int. Cl.[2] D01G *7/10*

U.S. Cl. 19—80 R **5 Claims**



1. A method of removing fibers from pallet means comprising the following steps:

relatively translating fiber-laden pallet means longitudinally with respect to fiber removal means;

removing the bulk of the fibers from the pallet means;

sweeping the surface of the pallet means to remove any fibers remaining after said removing step; and

depositing the fibers from said removing and sweeping steps on a transverse conveyor for movement to subsequent processing;

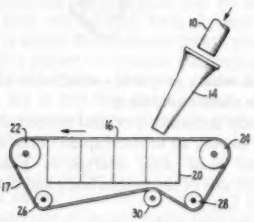
wherein said removing step includes breaking up aggregated fibers before said step of depositing.

4,035,870

FIBER DISTRIBUTION AND DEPOSITING APPARATUS

Imants Reba, Vancouver, Wash.; Gerald Hugh Hogland, Estacada, Oreg., and Edward Clair Wolthausen, Vancouver, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Dec. 24, 1975, Ser. No. 644,275
Int. Cl.² D04H 1/00
U.S. Cl. 19—155 **8 Claims**



1. Particulate fiber distribution and depositing apparatus comprising, in combination:

a. fiber transport means for transporting gaseously-entrained fibers and including a conduit having an outlet through which said gaseously-entrained fibers are adapted to be ejected from the conduit at a high velocity;

b. a forming bell adapted to receive said gaseously-entrained fibers from said fiber transport means conduit outlet and spread said fibers in a cross-machine direction, said forming bell including front and back walls the inner surfaces thereof uniformly converging and convexly curved in the direction of fiber flow along substantially the full extent of the length thereof and side walls connected to said front and back walls to define a passageway for said gaseously-entrained fibers from an inlet end defined by said walls to a substantially rectangular outlet end defined by said walls, said side walls diverging along straight lines in the direction of fiber flow, the cross-sectional area of said passageway remaining substantially constant along the length thereof, said forming bell inlet being spaced from said fiber transport means conduit outlet so that a gap is formed therebetween through which ambient air is entrained into said passageway; and

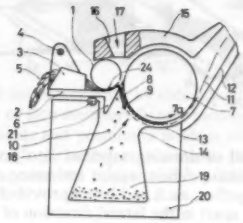
c. means defining a web-forming surface positioned adjacent to the outlet of said forming bell movable along a predetermined direction of movement and adapted to receive the fibers passing through said forming bell passageway after the fibers have been spread in a cross-machine direction by said forming bell.

4,035,871

OPENING AND CLEANING APPARATUS FOR AN OPEN END SPINNING UNIT

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed July 29, 1975, Ser. No. 600,053
Claims priority, application Germany, Aug. 22, 1974, 2440224
Int. Cl.² D01G 9/00
U.S. Cl. 19—200 **12 Claims**



1. Opening and cleaning apparatus for an open-end spinning unit comprising:

a fibre supply roller,

a supply table in facing relationship to said supply roller, said supply roller and supply table being disposed to define a fibre supply path therebetween and being configured to resiliently clamp said fibre at a clamping section,

an opener roller disposed downstream of said supply roller and supply table, said opener roller including clothing for beating impurities out of fibre tufts supplied thereto by said supply roller and supply table at a fibre supply section located downstream of said clamping section in the travel direction of said fibre tufts,

said supply table including a removal edge portion at the end of said clamping section closest to said opener roller, said removal edge portion of said supply table being immediately followed by a surface which retracts from said opener roller,

a fibre guide surface in facing relationship with a peripheral portion of said opener roller, said fibre guide surface and peripheral portion defining a guide path for guiding fibres into a fibre guide channel arranged downstream of said opener roller,

and an impurity removal opening extending from immediately adjacent said removal edge portion to said fibre guide surface, said removal opening having a defining wall which merges in a transition section thereof into said fibre guide surface, said transition section being of rounded configuration to form a converging fibre inlet opening into said guide path at the side of said removal opening opposite the supply table,

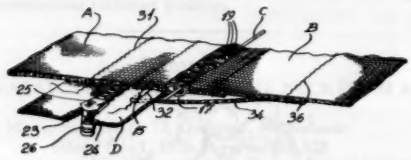
said removal opening and said supply roller and supply table being geometrically configured and disposed with respect to said opener roller so that the fibre tufts are offered to said opener roller at said supply section supported only at said clamping section, and without any support across the removal opening other than said opener roller, thereby permitting impurities to be beaten out of the fibres by the clothing and to fall freely into the removal opening without rebounding from a wall or other structure.

4,035,872

METHOD OF CLOSING FABRIC SEAMS

Donald George MacBean, Pierrefonds, Canada, assignor to JWI Ltd., Montreal, Canada

Filed Jan. 6, 1976, Ser. No. 646,977
Claims priority, application United Kingdom, Jan. 7, 1975, 00514/75
Int. Cl.[2] F16G 3/00, 7/01
U.S. Cl. 24—31 H 11 Claims



1. In a method of drawing together into juxtaposition the ends of a wide heavy fabric, againt resistance of said ends to being drawn together, each end being provided with an array of loops spaced apart in the lateral direction of the fabric and adapted to be intermeshed and brought into register to form an elongated tubular passage for receiving an elongated holding member to form a hinge-type joint, comprising the step of,

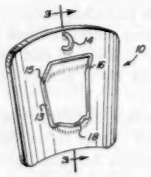
connecting a side of a gap closing device detachably laterally along each of the respective ends with complementary progressive fastening means of the device on each side extending from one edge to the other ready to be engaged to draw the ends of the heavy fabric together in increments and thereafter retaining the increments together in a relative holding position.

4,035,873

CLIP FOR RENDERING A BOLA TIE USABLE AS A PENDANT

Lee W. Epperson, 4121 W. Palo Verde Drive, Phoenix, Ariz. 85019

Filed Aug. 4, 1976, Ser. No. 711,478
Int. Cl.[2] A41D 25/04
U.S. Cl. 24—49 S 9 Claims



1. A bola tie assembly which permits the bola tie ornament to be separately worn as a pendant comprising:

a bola ornament,

a first frame means mounted on the back of said ornament and having two end members raised from the back surface of said ornament to each provide a passage for at least two end portions of a cord,

a second frame means of a slightly smaller outer configuration than said first frame means arranged for a limited movement adjacent said first frame means,

said second frame means having a tab extending outwardly of one of its ends longitudinally thereof,

clamping means mounted on said second frame means for yieldably engaging and holding the two end portions of the cord a loop of which extends through the passage formed by one end of the first frame means and the ornament for surrounding the neck of a wearer of the bola tie,

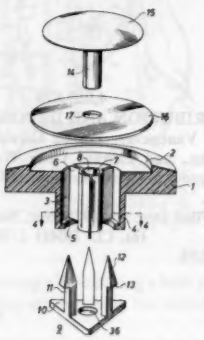
said second frame means being mountable within said first frame means by moving the tab of said second frame means outwardly of said ornament through the passage formed by the other end of said first frame means and said ornament until said second frame means can be juxtapositioned to said first frame means.

4,035,874

QUICKLY ATTACHABLE BUTTON

Sven Algot Joel Liljendahl, Gyllenstiernas vag 8, 175 76 Jarfalla, Sweden

Filed Apr. 20, 1976, Ser. No. 678,678
Claims priority, application Sweden, Aug. 29, 1975, 7509642
Int. Cl.[2] A44B 1/18, 1/42
U.S. Cl. 24—90 E 20 Claims



1. A button which is quickly attachable to sheet material such as textile cloth comprising

a button body including a central portion defining a button base and having an uninterrupted outer wall and an integral inner wall with interspaces generally arranged around the axis of the button body and between said outer and inner walls,

said button body including openings generally aligned parallel to the butt... axis from the bottom of the button body into said interspaces,

an attaching means comprising a supporting plate including at least two substantially mutually parallel pins projecting from one face of said supporting plate and arranged around a center axis thereof,

said pins having pointed heads adapted to be punched through said sheet material from the side of said material opposite to the side to which the button is to be attached,

said pins being adapted to be then inserted into said openings into said interspaces between said outer and inner walls of said button body for attachment of said button body to said sheet material,

the radially inwardly facing side of the head of each of said pins adjacent to said inner wall in the assembled position being substantially smooth,

said heads of said pins each having a radial dimension as measured along a radius from the center axis of said supporting plate which is greater than the remainder of the body of the associated pin,

the radial dimension of each of said interspaces between said inner and outer walls of said button body being at least as great as said radial dimension of said pin heads,

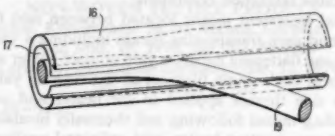
said outer wall of said button body including at least one radially inwardly extending flange at said openings into said interspaces to restrict said openings to a radial dimension substantially less than said radial dimension of each of said pin heads so that the materials of the structure must be temporarily deformed to permit insertion of said pins into said axial openings.

4,035,875

FASTENER ARRANGEMENTS FOR JOINING OR SEPARATING MATERIAL EDGES OR SURFACES

Volkmar Kobelt, Bockeroth, Friedrichshoher Strasse 33, D-533 Konigswinter, Germany

Filed June 2, 1975, Ser. No. 582,922
Claims priority, application Germany, June 5, 1974, 2427087
Int. Cl.[2] A44B *17/00*
U.S. Cl. 24—203 R 24 Claims



1. A fastener arrangement for joining or separating material edges or surfaces along a distance of indeterminate length, including two cooperating fastener halves secured to the one end and the other material component to be joined or separated; each fastener half being formed of a series of elemental length portions; each elemental length portion of the one fastener half cooperating with a separate elemental length portion of the other fastener half to form an element pair therewith; the improvement wherein each element pair has a first stable position in which the elemental length portions of the element pair are in a full, mechanical interengagement with one another; each element pair has a second stable position in which the elemental length portions of the element pair are mechanically fully disengaged from one another; each element pair has an unstable position in which the elemental length portions of the element pair are in a partial mechanical interengagement with one another; the fastener halves assuming a joined state where the element pairs are in said first stable position; the fastener halves assuming a separated state where the element pairs are in said second stable position; the improvement further comprising means incorporated in at least one elemental length portion of each element pair for exerting a force on the element pair where it is in its said unstable position, said force urging the element pair into one of its said stable positions; and slideless means for effecting, in the presence of at least one element pair in said unstable position, a self-propagation, from element pair to element pair, of a transition from the one stable position of the element pair through said unstable position into the other stable position; the elemental length portions of each series being disposed sufficiently close to one another to ensure said self-propagation by interaction between adjoining elemental length portions of the same series when the cooperating elemental length portions of element pairs of the one and the other series move from said unstable position into one of said stable positions.

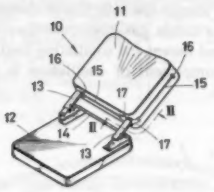
4,035,876

DUAL FASTENER SLIDER

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 17, 1975, Ser. No. 641,765
Claims priority, application Japan, Dec. 21, 1974, 49-155899
Int. Cl.[2] A44G *19/26, 19/00*
U.S. Cl. 24—205 R 2 Claims

1. In a slide fastener arrangement on a covering having a peripheral opening through which a rod member extends the improvement comprising in combination: a pair of stringer tapes carrying along their confronting longitudinal edges rows of interlocking fastener elements, said longitudinal edges being spaced away from each other at a region of the stringer tapes to define intermediate the opposite ends of the stringer tapes said opening for the extension therethrough of the rod member, said rows of interlocking fastener elements being separated by said opening to provide a pair of separate paths therealong; a pair of independent sliders separate from each other and each being independently movable respectively along said paths and each slider having a front and rear end; and means for locking said sliders in respective opposite positions on the rows of fastener elements to close said opening except for a portion thereof between said sliders through which portion the rod



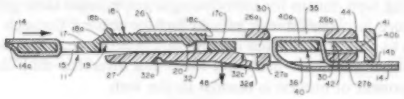
member extends in contact with the sliders, said locking means including a pair of stop members fixedly mounted on the rows of fastener elements and positioned in close contact with the respective rear ends of the sliders to maintain the front ends of the sliders held against the opposite sides of the rod member.

4,035,877

BUCKLE

Ivan F. Brownson, 16425 Otsego St., Encino, Calif. 91316, and Eric J. Brownson, 4730 Natick, Sherman Oaks, Calif. 91403

Filed Sept. 15, 1975, Ser. No. 613,048
Int. Cl.[2] A44B *13/00, 11/10*
U.S. Cl. 24—230 SL 9 Claims



1. A buckle for securing together two objects;
a male member connected to one of said objects and a female member connected to the other of said objects;
said male member having a first cutout;
a male flexible portion located over said first cutout and hinged to one side of said cutout for movement in said cutout;
a rigid locking bar located at another side of said cutout;
said female member having a second cutout;
a female flexible part located over said second cutout and hinged to one edge of said second cutout for movement in said second cutout;
said female flexible part having a bar engaging edge located opposite said locking bar when said members are in position to lock said buckle, said female part being moved by said flexible male portion to move said engaging edge away from said locking bar.

4,035,878

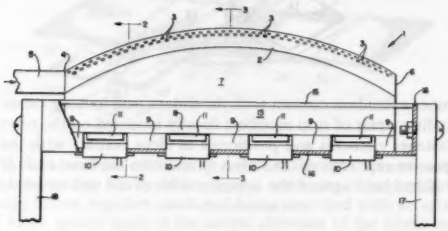
APPARATUS FOR SMOOTHING THE SURFACES OF MOVING WEBS

Joseph F. Cheatham, Sudbury, Mass., assignor to SW (Delaware), Inc., Providence, R.I.

Continuation-in-part of Ser. No. 521,179, Nov. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,838, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 331,199, Feb. 9, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,100
Int. Cl.[2] D06C *3/00*
U.S. Cl. 26—87 7 Claims

1. Apparatus for smoothing the surface of a moving web comprising a curved hollow bar having a web-treating surface, the web-treating surface of said bar having a plurality of ports

communicating with the interior of said bar, said web-treating surface having a curvature between about 0.1% and 5% as measured by the height of the center of the bar above the ends of the bar divided by the linear distance between the bar ends, support means for said bar adapted to maintain the bar adjacent to or in contact with a moving web, means for introducing a gas at superatmosheric pressure into the interior of said bar and through said ports, means for selectively closing a portion of said ports to form a stable gas cushion between said bar and said moving web and means for oscillating said bar in a direction such that a component of oscillation is normal to the surface of said web.



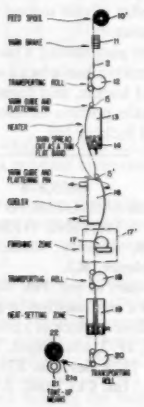
4. Apparatus for smoothing the surface of a moving web comprising a curved hollow bar, the surface of said bar having a plurality of ports communicating with the interior of said bar, said bar having a curvature as measured by the height of the center of the bar above the ends of the bar divided by the linear distance between the bar ends, support means for said bar adapted to maintain the bar adjacent to or in contact with a moving web, means for introducing a gas at superatmospheric pressure into the interior of said bar for exiting through said ports to pass between said bar and said moving web, and means for moving said bar back and forth in a direction such that a component of motion is normal to the web.

4,035,879

APPARATUS FOR PRODUCING TEXTURIZED YARNS

Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Sept. 29, 1975, Ser. No. 617,985
Claims priority, application Germany, Sept. 27, 1974, 2446139
Int. Cl.[2] D02G *1/00*
U.S. Cl. 28—246 **11 Claims**



1. Apparatus for draw-texturizing and heat-setting a thermoplastic preoriented multifilament yarn comprising:

feed means to supply the preoriented yarn to a residual stretching stage;

at least three yarn transporting means spaced from each other and operating at adjustably different rotating speeds, the second transporting means being driven at a higher rate of speed than the first transporting means to complete the residual stretching and the third transporting means bein driven at a lower rate of speed than the second transporting means to permit heat fixing of the yarn running between said second and third transporting means under adjustable relaxation conditions;

thermal treatment means located between said first and second yarn transporting means including a yarn guiding and flattening means, a yarn contact heater arranged to heat each single filament of the running yarn along one side thereof applied to the heater and unilateral cooling means following and thermally insulated from said yarn contact heater, said unilateral cooling means being arranged to quench each said single filament of the running yarn from its side opposite that applied to said yarn contact heater; and

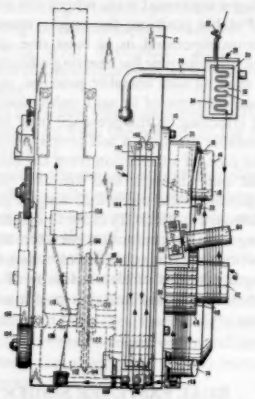
another heating means between said second and third yarn transporting means for heat-fixing the residually stretched yarn upon relaxation and self-crimping resulting from a differential shrinkage over the transverse cross-section of each individual filament.

4,035,880

APPARATUS FOR DRAWING AND CRIMPING YARN

William H. Hills, Melbourne, and Milton H. Borgman, West Eaugallie, both of Fla., assignors to Carisbrook Industries Inc., Iselin, N.J.

Filed Oct. 3, 1975, Ser. No. 619,231
Int. Cl.[2] D02G *1/12*; D02J *1/22*
U.S. Cl. 28—220 **5 Claims**



1. A yarn treating apparatus comprising:

a yarn crimper having a pair of feed rolls for moving yarn into a crimping chamber,

feed roll drive means for rotating said feed rolls at a constant rate of rotation to move yarn into said crimping chamber at a fixed linear rate,

first and second draw rolls for drawing the yarn positioned in advance of said feed rolls and spaced therefrom along the yarn path,

means for rotating said first draw roll at a first peripheral speed,

means for rotating said second draw roll at a second peripheral speed greater than said first peripheral speed, said yarn passing first around said first draw roll and then around said second draw roll whereby said yarn is drawn,

said means for rotating said second draw roll comprising a

variable speed drive to adjust the peripheral speed of said second draw roll to maintain the yarn between said second draw roll and said feed rolls at a constant predetermined tension, and

means for heating said yarn at a point between said first and second draw rolls.

4,035,881

METHOD AND APPARATUS FOR PRODUCING NON-WOVEN TEXTILE PRODUCT

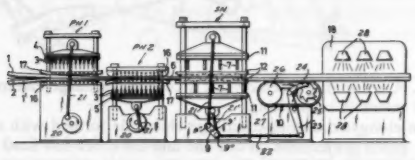
Josef Zocher, Kreuzstrasse 26, 51 Aachen, Germany

Filed Mar. 10, 1975, Ser. No. 557,186

Claims priority, application Germany, Mar. 12, 1974, 2411685

Int. Cl.[2] D04H *18/00*

U.S. Cl. 28—111 **12 Claims**



6. Apparatus for producing a non-woven textile fabric having tufts or strands projecting from opposite faces thereof, comprising, in combination, means for transporting a web means of non-woven textile material stepwise along substantially rectilinear path; and a unit located upstream of said transporting means for forming on said web means tufts of strands projecting from opposite faces thereof, said unit comprising a pair of needle holders respectively arranged to opposite sides of and substantially parallel to said path, a plurality of needles carried by each of said needle holders and projecting therefrom normal thereto toward the other needle holder and spaced from each other in longitudinal and transverse direction of said path and each having a free end constructed to displace during penetration of the needles into said web means strands of material of the web means in a direction transverse to the longitudinal direction of the latter, the needles carried by one of the needle holders being arranged between and symmetrically with respect to the needles carried by the other of said needle holders, a guide plate for each needle holder arranged between the latter and the web means substantially parallel thereto and each formed with openings therethrough through which the needles carried by the respective needle holder project, and with cavities extending from the surface facing the web means into the guide plate, said cavities extending substantially in the direction in which said web means is transported by said transporting means and being respectively aligned with the needles carried by the other needle plate for receiving the tufts produced during penetration of said needles into said web means, and moving means connected to said needle holders for simultaneously moving the same in opposite direction along an active and a return stroke.

4,035,882

LOOM BOBBIN STRIPPER

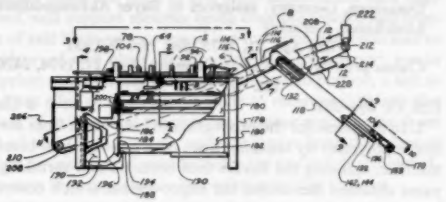
Richard Ferguson, and Kenneth W. Troutman, both of Charlotte, N.C., assignors to The Terrell Machine Company, Charlotte, N.C.

Filed Oct. 18, 1976, Ser. No. 733,411

Int. Cl.[2] D03D *45/60*

U.S. Cl. 28—294 **17 Claims**

1. In a filling bobbin stripper incorporating means for supporting and guiding bobbins serially in a path while hanging from the heads thereof, and rotating reel means spaced below said hanging bobbins for engaging and removing waste from the depending barrels thereof, the improvement which comprises air ducts disposed immediately below the supporting means on which said bobbins are guided and adjacent the guided bobbins, said air ducts being formed to direct an air blast downwardly along said depending bobbin barrels aimed



at a zone about two-thirds downwardly of the depending barrel length to entrain waste therefrom and direct said waste for engagement by said reel members.

4,035,883

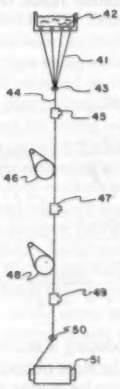
MULTIPURPOSE INTERMINGLING JET AND PROCESS

Norman John Bond, Pineville, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Mar. 14, 1975, Ser. No. 558,571

Int. Cl.[2] D02G *1/20, 1/16*

U.S. Cl. 28—220 **7 Claims**



1. In a continuous filament-forming process for the preparation of drawn thermoplastic yarns, the improvement comprising the step of compacting as-spun yarn to coherency factors of from 5 to >1000, after solidification of said yarn, at a point where fusion and filament deformation is no longer possible, and then drawing the compacted yarn, said compacting step being conducted with an intermingling jet suitable for operation at low fluid pressures and velocities, said jet containing a substantially circular cross-section bore adapted for passage of multifilament yarn therethrough, and two fluid inlets leading into said bore, said two inlets being axially opposed and centrally disposed and perpendicular to the longitudinal axis of said bore, said bore having length-to-diameter ratio of 1:1 to 2:1, said fluid inlets having a cross-sectional area less than that of said bore.

4,035,884

PROCESS FOR THE PRODUCTION OF BULK YARNS

Hermann Lohwasser; Alfred Nogaj, and Ulrich Reinehr, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 21, 1975, Ser. No. 569,931
Claims priority, application Germany, Apr. 27, 1974, 2420472
Int. Cl.[2] D02J 1/22
U.S. Cl. 28—281 8 Claims

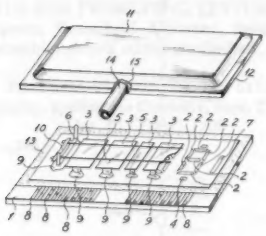
1. In a process for the production of bulk yarns from acrylonitrile polymers by breaking tows on a conventional breaking machine, spinning the slivers thus obtained and shrinking the yarns obtained therefrom, the improvement which comprises heat drafting tows consisting of a single tow consisting of chemically different filaments or at least two chemically different tows together and thereafter passing the heated tow or tows to a breaking machine.

4,035,885

METHOD FOR PRODUCING MULTI-FIGURE LUMINESCENT DISPLAY TUBES

Katsuyuki Matsushita; Hideo Murayama; Kazufumi Yawata, and Masaki Kobayakawa, all of Izumi, Japan, assignors to Nippon Electric Kagoshima, Ltd., Izumi, Japan

Filed Dec. 22, 1975, Ser. No. 643,006
Claims priority, application Japan, Dec. 27, 1974, 50-1875
Int. Cl.[2] H01J 9/02
U.S. Cl. 29—25.14 3 Claims



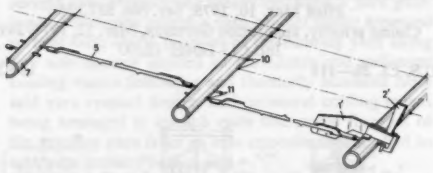
1. A method for producing a multi-figure luminescent display tube, comprising the steps of preparing an insulator body including segment electrodes having phosphor layers applied thereon, baking the phosphor layers to control their luminous brightness, assembling parts onto the insulator body, and applying a frit glass mixed with a binder on connecting portions between the parts and the insulator body, placing the insulator body on which the parts are assembled into a baking furnace, baking the frit glass to stably fix the parts onto the insulator body, and sealing the insulator body to a container with the parts affixed to the insulator body being covered by the container, the improvement comprising removing the binder by heating the frit glass mixed with the binder applied on connecting portions between the parts and the insulator body by an infrared ray heater prior to said baking step, and wherein said baking step comprises baking the frit glass in a non-oxidizing environment in the baking furnace to stably fix the parts onto the insulator body to maintain the previously controlled luminous brightness of the phosphor layers.

4,035,886

TENSIONING DEVICE FOR CORONA-DISCHARGE ELECTRODES

Walter Gluck, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 24, 1976, Ser. No. 726,429
Claims priority, application Germany, Oct. 16, 1975, 2546305
Int. Cl.[2] H01J 9/06
U.S. Cl. 29—25.19 5 Claims



1. A tensioning assembly for a corona-discharge electrode, said assembly comprising:

an elongated corona-discharge electrode formed with staggered projections on one end and the other end fixed to a rigid tubular frame;

said frame having a side relative to which said one end is displaceable to tension said electrode;

two legs, one C-shaped member comprising a metal plate having a leg formed with a pair of mutually offset laterally projecting pins engaged behind respective projections of said one end of said electrode, and the other leg reaching around so that each leg is on opposite sides of said side of said frame, said other leg being formed with guide means inclined to the plane of said frame and said electrode, said other leg being further provided with an abutment confronting said side of said frame; and

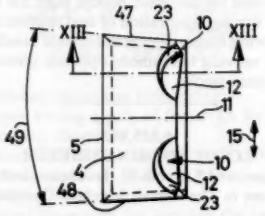
a wedge received in said guide means and bearing against said side of said frame and said abutment for drawing said staggered projections toward said side thereby tensioning said electrode between its ends.

4,035,887

CUTTING TOOLS

Karl Hertel, Oedenberger Strasse 29, D-8500 Nuremburg, Germany

Division of Ser. No. 620,500, Oct. 7, 1975, Pat. No. 3,986,276.
This application July 29, 1976, Ser. No. 709,912
Claims priority, application Germany, July 23, 1975, 2532825
Int. Cl.[2] B26D 1/00
U.S. Cl. 29—95 R 5 Claims



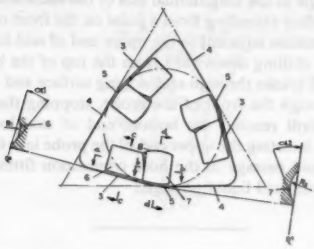
1. A cutting bit having a rhombus-like vertical cross sectional shape and comprising upper and lower spaced-apart faces and flank surfaces extending between said upper and lower faces, a cutting edge formed by a junction of said upper face and one of said flank surfaces, and two substantially flat bottomed recesses which open into another of said flank surfaces remote from said one flank surface, the bottom surfaces of said recesses extending inwardly from said another flank surface at an acute angle to said lower face.

4,035,888

DETACHABLE CUTTING PLATE FOR DESCALING ROUND BARS ON A CENTERLESS MACHINE

Gerard Romagnolo, Eybens, France, assignor to Ugine Carbone, Grenoble, France

Filed Aug. 6, 1976, Ser. No. 712,055
Claims priority, application France, Sept. 12, 1975, 75.28886
Int. Cl.[2] B26D 1/00
U.S. Cl. 29—95 R 13 Claims



1. A detachable cutting plate of polygonal, equilateral, but not equiangular, shape designed for centerless descaling of rough-drawn or rough-rolled materials, by radial mounting on a rotary multi-tool head, and including lengths, each having a main cutting edge having a straight part and a curved part connecting the main cutting edge to a secondary planing edge, said plate characterized in that it comprises along each main cutting edge two chip-breaking surfaces consisting of separate concave grooves, generated by segments of curves respectively tangent at their lowest point to one and the same directing axis;

a. the first chip-breaking surface facing the straight part of the main cutting edge, of which the axis directing the surface is parallel with the said edge and forming a cutting angle α_1;

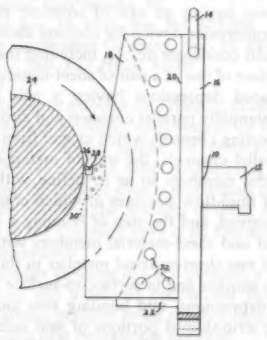
b. the second chip-breaking surface facing the curved part connecting the main cutting edge to the secondary planing edge and having a directing axis perpendicular to the plane bisecting the curved part and forming a cutting angle α_2.

4,035,889

CUT OFF TOOL

James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed May 14, 1976, Ser. No. 686,510
Int. Cl.[2] B26D 1/12
U.S. Cl. 29—96 6 Claims



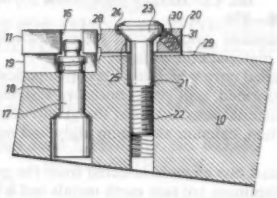
1. In a grooving and cut off tool structure; a planar support blade of substantial size having upper and lower ends and front and back edges and side faces and relatively thin in a direction perpendicular to the side faces of the blade, cutting element support means carried by said blade along the front edge for supporting a cutting element, and a rigid support member extending along and fixed to said blade adjacent the back edge thereof, said support member being concave toward said front edge of said blade when viewed in a direction perpendicular to the plane of said blade, said cutting element support means comprises a second member with a blade-like portion, a slot in said front edge of said support blade to receive said blade-like portion of said second member, an angular notch in the front edge of said blade adjacent said slot, and a laterally enlarged portion on said second member seated in said notch and including means for supportingly receiving a cutting element.

4,035,890

TOOLHOLDER

Stig-Lennart Eriksson, and Manfred Wallace Gustafsson, both of Fagersta, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed May 17, 1976, Ser. No. 687,199
Claims priority, application Sweden, May 20, 1975, 7505703
Int. Cl.[2] B26D 1/00
U.S. Cl. 29—96 5 Claims



1. In a copying toolholder for clamping a slender-formed copying insert (11) into an insert-receiving site in a fore portion of a holder shank (10), there being a pin (17) fitted into a bore (18) in the holder while received in the aperture (16) of the insert, and there being a clamp plate (20) and associated actuating device (22) positioned for acting on an adjacent edge surface of the insert to urge said clamp plate and said insert against said pin, the improvement according to which the clamp plate is provided with a V-shaped pocket comprising two side surfaces (26, 27) for abutment with two converging edge surfaces of the insert, the angle between said side surfaces being less than 90°, the lower surface of said clamp plate having serrations (29) extending in the longitudinal direction of the fore portion of said shank adapted to cooperate with and be slidable along mating serrations on the upper surface of said fore portion of the shank upon tensioning said actuating device (22).

4,035,891

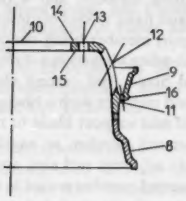
METHOD OF FORGING AND PRESS-FORMING ALUMINUM WHEEL

Roger Lucas, Issoire, and Jacques Auberger, Jumeaux, both of France, assignors to FORGEAL, societe pour le Forgeage et l'Estampage des Alliages Legers, Paris, France

Filed June 16, 1976, Ser. No. 696,560
Claims priority, application France, July 3, 1975, 75.21774
Int. Cl.[2] B21H 1/02; B21K 1/32
U.S. Cl. 29—159.01 4 Claims

4. The method of making aluminum wheels for vehicles comprising the following steps: forming the wheel disc component and the minor flange of the rim by forging from a blank substantially in the form of a cylindrical disc, forming the major flange component of the rim by press-forming from a

tubular cylindrical element, assembling by welding the wheel disc component and the minor flange of the rim on the one



hand and the major flange component of the rim on the other hand.

4,035,892

COMPOSITE CALCIUM CLAD MATERIAL FOR TREATING MOLTEN METALS

Tohei Ototani, and Yasuji Kataura, both of Sendai, Japan, assignors to Tohei Ototani, Sendai, Japan

Continuation-in-part of Ser. No. 374,431, June 28, 1973, abandoned. This application July 23, 1975, Ser. No. 598,477

Claims priority, application Japan, June 30, 1972, 47-65757; Dec. 27, 1972, 48-161573

Int. Cl.[2] B21D *49/00*; B23K *35/02*

U.S. Cl. 428—576 **9 Claims**

3. A composite calcium clad material for treating molten metal, said material consisting of

1. a solidified core which has been mechanically compressed and deformed, said core consisting essentially of

A. a material selected from the group consisting metallic calcium, calcium aluminum alloy and mixtures thereof, and

B. at least one element selected from the group consisting of aluminum are rare earth metals and a flux of silicates, oxides or halides of alkaline earth metals, and

2. a sheath of iron or alloy thereof in which said core is encased, the core being 10–90 percent by weight based on the composite material.

4,035,893

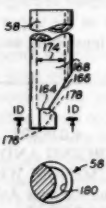
METHOD OF MAKING BEER DISTRIBUTING EQUIPMENT AND PRODUCT OBTAINED

David Zurit, Tenafly, N.J., and Frank Sciara, Floral Park, N.Y., assignors to Vending Components, Inc., Hackensack, N.J.

Division of Ser. No. 411,238, Oct. 31, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,552

Int. Cl.[2] B23P *15/00, 13/02*

U.S. Cl. 29—157 R **4 Claims**



1. The method of making a hose connecton fitting of a beer keg keg tapping apparatus which has a probe for opening a check valve in a keg fitting, which method comprises taking a length of bar stock which is separate from the apparatus with which it is to be used but equal to the length of the desired probe, said bar stock when vertically oriented with respect to its longitudinal axis having a top and bottom located at the ends of the bar stock and a front surface extending along the length of the bar stock, said front surface having an upper end and a lower end portion adjacent said top and bottom, respectively, rotating the bar stock, in a cutting machine, about an axis which is eccentric of the axis of the bar stock, cutting away a portion of material from the lower front end portion of the bar stock during such rotation to form a lower end portion of the probe located mostly on one side of the longitudinal axis of the bar stock to serve as a check valve-operating abutment at the lower end of the probe, cutting away other material from the front end of the bar stock, above said lower end portion, and at an angle to the longitudinal axis of the bar stock to form a sloping surface extending from a point on the front of the bar stock to a location adjacent to the upper end of said lower end portion, and drilling downward from the top of the bar stock until the drill breaks through said sloping surface and forms an opening through the front of the probe, stopping the drilling before the drill reaches the bottom end of said lower end portion, and inserting the upper end of the probe into the lower end of a liquid passage in the hose connection fitting and in alignment with said liquid passage.

4,035,894

AIR CONDITIONING APPARATUS AND METHOD FOR MAKING THE SAME, PARTICULARLY FOR AUTOMOTIVE VEHICLES

Rudolf Hintze, Lessingstrasse 32, Heusenstamm, Germany

Division of Ser. No. 469,441, May 20, 1974, Pat. No. 3,953,985, which is a continuation-in-part of Ser. No. 307,212, Nov. 16, 1972, Pat. No. 3,852,976. This application Aug. 19, 1975, Ser. No. 605,830

Claims priority, application Germany, Nov. 19, 1971, 2157380; May 20, 1974, 2325282

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 R **6 Claims**

1. A method of making an air conditioning apparatus, particularly for automotive vehicles, comprising the steps of providing a support having an axis of rotation; mounting on the support a compressor device for rotation about said axis; making an annular condenser device, including the step of forming a major surface of one of a pair of sheet-material members with channel-shaped depressions having a pair of transversely-spaced substantially parallel channels and also having a plurality of connecting channels which extend from one to the other of said parallel channels, the step of juxtaposing said pair of sheet-material members so as to define with one another a plurality of fluid-flow passages in which compressed cooling agent is received, and the step of bonding a major surface of the other of said sheet-material members with the major surface of said one sheet-material member in fluid-tight relationship to one another and in surface-to-surface contact intermediate said depressions, said bonding step including sealingly connecting strip-shaped portions of said members which are located between successive ones of said connecting channels with one another; and mounting said condenser device circumambiently about said compressor device on said support for joint rotation with said compressor device.

4,035,895

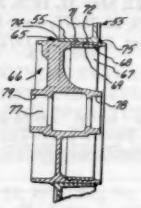
METHOD OF MAKING COMPOSITE MOTORCYCLE WHEEL

Thomas J. Lester, Aurora, Ohio, assignor to The Lester Tire Company, Bedford Hts., Ohio

Division of Ser. No. 648,954, Jan. 14, 1976, which is a continuation-in-part of Ser. No. 555,052, March 3, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,242

Int. Cl.[2] B21K *1/34*

U.S. Cl. 29—159.03 4 Claims



1. A method of making a motorcycle wheel comprising the steps of providing as castings of a weldable lightweight metal including aluminum, magnesium and alloys thereof, a hub unit, and a wheel unit having a centrally open tubular portion to receive said hub unit and having a concentric rim portion integrally connected to said tubular portion by angularly spaced-apart spokes; heat treating the castings to relieve casting stresses; machine finishing the units including finishing the circular end surfaces of said tubular portion and finishing the outer surface of the hub unit and the inner surface of the tubular portion of the wheel unit to provide substantially complimentary cylindrical surfaces of which said inner surface is slightly smaller in diameter than said outer surface at ambient temperature and slightly larger in diameter at an appreciably higher than ambient temperature when the hub unit means remains at ambient temperature; inserting the hub unit into said machined inner surface with said wheel unit heated sufficiently to receive the hub unit; cooling said wheel unit to shrink-fit it on said hub unit; and welding one circular end surface of the tubular portion around an end portion of said outer surface which projects axially beyond said one end surface while rotating said shrink-fitted wheel and hub units about the axis of said inner and outer surfaces.

4,035,896

DEVICE FOR CRIMPING CONDUCTORS ONTO CONTACTS OF A CONTACT STRIP

Alois Ruppert Resch, Heilbronn, Germany, assignor to Bunker Ramo Corporation, Oak Brooks, Ill.

Filed Apr. 15, 1976, Ser. No. 677,509

Claims priority, application Germany, Apr. 15, 1975, 2516399

Int. Cl.[2] H01R *43/04*

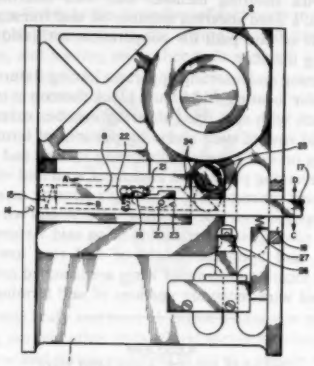
U.S. Cl. 29—753 7 Claims

1. Apparatus for use in a device for crimping conductors into the contact members of a contact strip, the device being of the type having a motor driven means for reciprocating two crimping jaws relative to each other and feeding means for stepwise advancing the contact strip in increments corresponding to the distance between the contacts in order to feed one contact at a time to the crimping jaws in an operational cycle, said apparatus comprising:

an actuating member movable to a rest position, a first operational position, and a second operational position, said second operational position being reached only after passing through said first operational position;

first means for activating said feeding means to advance said contact strip and position a contact between said crimping jaws when said actuating member is in said first operational position; and

second means for activating said motor driven means to effect crimping action of said crimping jaws and for re-



turning said feeding means to its initial position when said actuating member is in said second operational position.

4,035,897

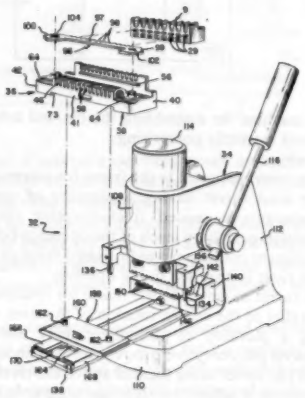
APPARATUS FOR CONNECTING CONDUCTORS TO CONTACT TERMINALS IN AN ELECTRICAL CONNECTOR

William Roderick Over, Harrisburg, and Ronald Carl Brehm, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 7, 1976, Ser. No. 693,655

Int. Cl.[2] H01R *43/04*

U.S. Cl. 29—56.6 21 Claims



1. Apparatus for inserting wires into the wire-receiving portions of electrical contact terminals, said terminals being contained in an insulating housing with said wire-receiving portions arranged in side-by-side relationship in a row and with said wire-receiving portions facing in a common direction, said apparatus comprising:

a wire trimming and inserting apparatus and a fixture means, said fixture means comprising a fixture block having housing supporting surface for supporting said housing in a predetermined position, wire locating means for locating wires in side-by-side relationship in spaced relationship to said housing supporting surface with said wires in alignment with said terminals in a housing disposed on said housing supporting surface,

said trimming and inserting apparatus comprising frame

means, a ram in said frame means, said ram being reciprocable along a predetermined path, said ram having a movable wire shearing member and wire inserting means thereon, a fixed shearing member on said frame means on one side of said path for cooperation with said movable shearing member,

said trimming and inserting apparatus having fixture locating means for locating said fixture block thereon at one end of said path with said fixed shearing member extending beside said row of wire-receiving portions of terminals in a housing on said housing supporting surface and with said wire-receiving portions in alignment with said wire inserting means whereby, upon placing a housing on said housing supporting surface, locating wires in said wire locating means placing said fixture block on said fixture locating means, and upon movement of said ram towards said fixture locating means said wires are trimmed and inserted into said wire-receiving portions of said terminals.

4,035,898

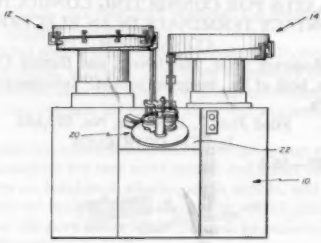
BLIND RIVET ASSEMBLING

Milton Bennett, Bridgewater, Mass., assignor to Philstone Nail Corporation, Canton, Mass.

Filed Sept. 4, 1975, Ser. No. 610,172

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—788 **9 Claims**



1. A machine for assembling the pin and tubular rivet of a blind rivet assembly comprising:

a frame;

a rivet turret mounted to the frame for rotation about an axis, the rivet turret having a plurality of circumferentially equiangularly spaced rivet-receptive openings formed about its periphery, each of the openings being of a configuration to enable a pin to be passed through the rivet while the rivet is disposed in the opening;

a pin turret mounted to the frame for rotation about an axis parallel to the axis of rotation of the rivet turret and having a plurality of circumferentially and equiangularly spaced pin-receptive grooves formed about its periphery, the pin turret being located above the rivet turret and in a position in which the rivet and pin carried by said turrets may be brought into substantially axial alignment at an assembly station;

drive means for rotatable indexing of each pin and rivet turrets in unison and in angular increments to enable a succession of rivets and pins to be aligned at the assembly region;

a series of hammers mounted to the frame above the rivet turret for movement toward and away from the rivet turret, the first of said hammers being disposed above and in alignment with the assembly region, the remaining of the hammers in the series being located at each of the successive indexed positions of the rivet turret, the hammers being arranged so that the first may drive the pin into the rivet and the successive hammers may each drive the pin partly through the rivet, the last of the hammers in the series being arranged to drive the pin fully into the rivet; and

means for operating said hammers in a hammering stroke while the rivet turret is at rest at an indexed position.

4,035,899

AUTOMATIC TAPE CASSETTE-ASSEMBLING SYSTEM

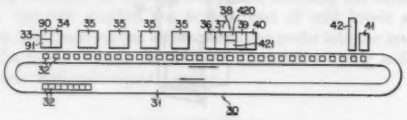
Hironobu Matsuda, Machida, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1976, Ser. No. 665,166

Claims priority, application Japan, Mar. 10, 1975, 50-28822; May 16, 1975, 50-65322; May 31, 1975, 50-73380; June 2, 1975, 50-74653; June 6, 1975, 50-76475; June 6, 1975, 50-76476

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—773 **30 Claims**



1. A system for automatically assembling a magnetic tape cassette including first and second cassette housing halves, a pair of reel hubs received in the cassette housing halves and a magnetic tape wound about both reel hubs, which comprises at least one magnetic tape loading device for winding a magnetic tape about the reel hubs and loading the reel hubs and magnetic tape into the first cassette housing half, wherein the magnetic tape-loading device includes at least one magnetic tape takeup jig; a reel hub-fitting device for setting the reel hubs onto the jig; a magnetic tape takeup device for winding a prescribed amount of magnetic tape about the reel hubs placed on the jig; and a magnetic tape-transferring device adapted to hold the reel hubs mounted on the magnetic tape takeup jig and magnetic tape in substantially the same position as that in which both reel hubs and magnetic tape are to be finally received in the magnetic tape cassette and thereafter to transfer both reel hubs and magnetic tape into the first cassette housing half from the jig.

4,035,900

INSERT INSTALLING MACHINE

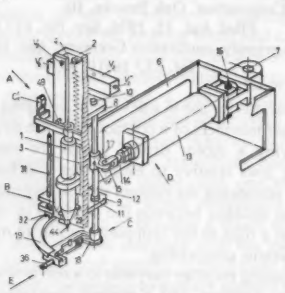
Daniel Boyko, 9/16 Barzilai St., Rishon Le Zion; David Wallach, 10 Ness Ziona St., Holon, and Mordecai Gasul, 186/24 Jerusalem Blvd., Kiriath Sharett, Holon, all of Israel

Filed Mar. 31, 1976, Ser. No. 672,548

Claims priority, application Israel, May 9, 1975, 47265; Mar. 9, 1976, 49178

Int. Cl.[2] B23Q *7/10*

U.S. Cl. 29—795 **24 Claims**



1. Inserts installing machine of the type having a framework for supporting a vertically reciprocable, horizontally tractable installer head with a rotatable spindle onto which inserts are threaded one at a time for the installation thereof in suitable bores provided in the work and control means for reversing the rotation of the spindle on every installing cycle, said ma-

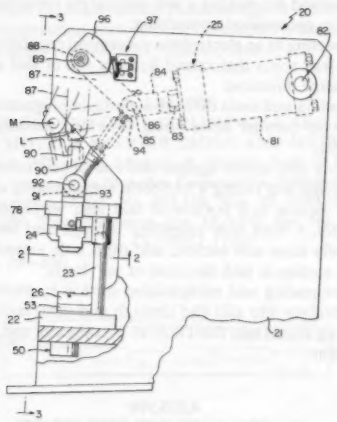
chine comprising insert holding means transferable between a first position, wherein the insert is held in axial alignment with respect to said spindle and a second position; means for transferring the said holding means from the first position to the second position after the threading of an insert on said spindle and means for feeding inserts to said holding means when in the second position, wherein said insert holding means comprises a spring-biased, insert arresting member normally engaging an insert positioned within a recessed insert supporting block, said block being mounted on an arm member journalled to said framework.

4,035,901

APPARATUS FOR JOINING TWO ABUTTING METAL MEMBERS TOGETHER AND METHOD OF MAKING SUCH APPARATUS

Joseph W. Lux, and John M. Varanelli, both of Waterbury, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed July 22, 1976, Ser. No. 707,780
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—243.5 **10 Claims**



1. In an apparatus for joining two abutting metal members together by lancing and forming a part of one member through an unblanked part of the other member and thereafter staking said lanced and formed part of said one member to an adjacent surface of said other member to secure said members together in abutting relation, the improvement wherein said apparatus has a single reciprocating head having a first means that performs said lancing and forming step on a first stroke thereof and having a second means that performs said staking step on a second stroke thereof.

4,035,902

METHOD OF MANUFACTURING HOLSTER

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Temecula, Calif.

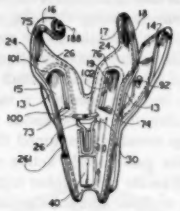
Division of Ser. No. 492,757, July 29, 1974, Pat. No. 3,977,583. This application Apr. 23, 1976, Ser. No. 679,773
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—446 **2 Claims**

1. A method of assembling front opening holsters comprising:

forming a body of leather like material in the shape of a pair of generally triangular intercepting sides along one edge and when closed, defining a handgun holding pocket with a front;

opening positioning a spring member on the inner face of each side of said body with one end of the spring extending along the front opening region of each side and the other end of the spring extending generally normal to the respective side of said body;

stitching a lining to the inner face of said body to cover both said spring members in the region of said front opening region, and leaving said other ends exposed;



folding said body and liner to define a handgun pocket; and

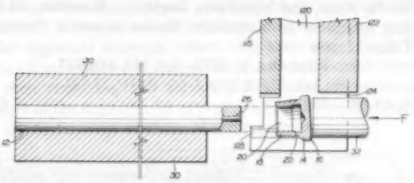
securing the said other ends of said spring members together to allow said spring members to act as a unitary member to bias said front opening to a generally closed position.

4,035,903

METHOD OF MANUFACTURING A SACRIFICIAL ANODE ROD ASSEMBLY

Lewis W. Taggart, Tulsa, Okla., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 543,615, Jan. 23, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 681,094
Int. Cl.[2] B23P *3/00, 25/00*
U.S. Cl. 29—458 **6 Claims**



1. The method of making a sacrificial anode assembly for the cathodic protection of the internal surfaces of ferrous metal water-containing vessels comprising:

A. providing an anode rod member of a galvanically active metal and of a selected length and a selected substantially uniform diameter throughout its length and wherein the galvanically active metal surrounds a centrally disposed core wire;

B. providing an externally threaded elongated hollow metal cap member of a dissimilar from the galvanically active metal anode member and of a selected wall thickness, said cap member being provided with an internal recess which extends axially inwardly from an opening at one end of the cap member for a selected distance therein, said recess having a diameter slightly greater than the diameter of the anode rod member and at least one portion of said recess remote from said end of said cap member having a relatively greater diameter with respect to the remainder of said recess, said recess having at its base a centrally located cavity;

C. clamping and tightly holding the major portion of said anode rod member between a plurality of force-applying surfaces substantially conforming in shape to the external configuration of the anode rod member while allowing a minor portion of one extremity of the anode rod member to protrude a selected small amount from said force-applying surfaces;

D. applying a selected amount of an electrical contact lubri-

cant containing metal particles to at least one of said members in the area where the members are to be joined;

E. positioning and aligning said cap member onto the anode rod member extremity which protrudes from said force-applying surfaces such that the anode rod member extremity fits snugly into said recess of said cap member and the cap member is axially aligned with the anode rod member extremity while ensuring that the engaging surfaces of said cap member and said anode rod member extremity have positioned therebetween a substantially uniform distribution of the electrical contact lubricant; and

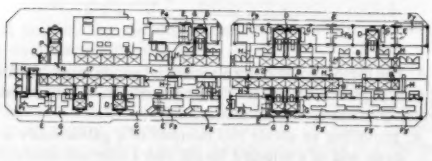
F. applying to the cap member a sufficient force in the longitudinal direction of the anode rod member and the elongated cap member positioned thereon to metallurgically upset the galvanically active metal of the said extremity of the anode rod member to cause the galvanically active metal to flow and substantially uniformly fill the recess of the cap member, including the portion of the recess having a relatively greater diameter and effect contact between the core wire and the walls of the centrally located cavity of the recess, thereby producing a sacrificial anode assembly while establishing a tight, leak-proof joint with a multiple of current-carrying bridges of metal particles between the engaging wall surfaces of said anode rod member extremity and the walls of said recess and without materially disturbing the initial wall thickness and basic configuration including the external threads of the elongated cap member.

4,035,904

AUTOMATIC ARTICLE WORKING SYSTEM

Susumu Ishizaka; Taizo Kondo, both of Komatsu; Hiroshi Shoda, Kaga, and Masakatsu Sugimoto, Komatsu, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,937
Int. Cl.[2] B23Q 7/00; B23P 23/00
U.S. Cl. 29—563 **7 Claims**



1. An automatic article working system which comprises:

a. a plurality of pallets for loading articles to be worked, each of said pallets conveying the articles to be worked;

b. pallet conveyor means for conveying said pallets, said conveyor means being movable along a horizontal path and in the vertical direction;

c. pallet storing means located on both sides of said path;

d. a plurality of machine tools provided adjacent to said pallet conveyor means;

e. pallet transfer and storing means provided between said machine tools and said pallet storing means for moving said pallets in and out of said pallet storing means, said pallet transfer and storing means including a rack portion to deliver the pallet to said pallet conveyor means;

f. manipulator means provided between said pallet transfer and storing means and said machine tools, said manipulator means transfering the articles to be worked on a taken-out pallet between said machine tools and said pallet, said pallet transfer and storing means further including a developing portion for moving said pallet into the range of said manipulator means; and,

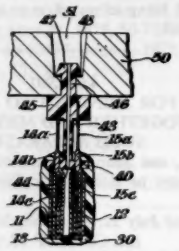
g. computer means operatively connected to all of said means for controlling the operation thereof.

4,035,905

WET ELECTROLYTE VALVE METAL CAPACITOR WITH A FREE-FORM ENCAPSULANT

Warren J. Clement, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 8, 1976, Ser. No. 664,787
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—570 **11 Claims**



1. A method for making a wet electrolyte capacitor having a free-form encapsulant comprising:

a. connecting to an electrolytic valvemetal capacitor section, two lead wires that extend from an end of said section in the same direction;

b. threading said leads through a plastic impregnation header via two parallel holes being provided therefor in said header;

c. seating said header against said end of said section;

d. applying and curing a free-form encapsulating coating to said section to a portion of said lead wires and to said header, a third hole extending through said header outwardly from said section, said third hole extending from said section in said direction of said leads;

e. impregnating said encapsulated section by passing a wet electrolyte into said end through said third hole; and

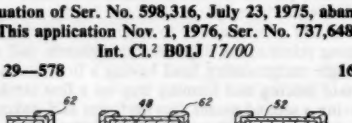
f. sealing closed said third hole at the opposite end from said section.

4,035,906

SILICON GATE CCD STRUCTURE

Al F. Tasch, Richardson, Tex., and Robert C. Frye, Brighton, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 598,316, July 23, 1975, abandoned.
This application Nov. 1, 1976, Ser. No. 737,648
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—578 **16 Claims**



1. In a method of fabricating a charge coupled device including an elongated channel overlaid by phase electrodes extending across the channel, a first set of alternate ones of said electrodes being formed by process steps separate from the prior to process steps forming a second set comprising the intervening electrodes, said electrodes being electrically isolated from each other and from an underlying surface of a semiconductor substrate in which said channel is defined, corresponding portions of said electrodes being underlaid by modified surface potential regions in said semiconductor surface extending across said channel, the improved method of

forming said modified surface potential regions under said first set of electrodes comprising the steps of:

forming a uniform thickness layer of insulating material on said surface of said semiconductor substrate;

implanting dopant ions into said insulating layer at spaced regions thereof across said channel;

forming strips of polycrystalline material over said insulating layer to define said first set of phase electrodes extending across said channel such that first portions of said strips overlie respective portions of said doped regions of the insulating layer while second portions of said strips overlie undoped regions of said insulating layer, said polycrystalline strips being formed by a process which causes no significant diffusion of said dopant material from said insulating layer into said semiconductor substrate;

removing said insulating material from between said polycrystalline strips and forming a layer of insulating material over said polycrystalline strips and between said polycrystalline strips to have said uniform thickness between said polycrystalline strips;

and during said fabrication heating said insulating material to cause significant out diffusion of said implanted dopant impurities into the surface of said semiconductor substrate to form modified surface potential regions underlying said corresponding portions and self-aligned with corresponding edges of said polycrystalline strips.

4,035,907

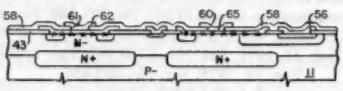
INTEGRATED CIRCUIT HAVING GUARD RING SCHOTTKY BARRIER DIODE AND METHOD

Richard J. Allen, and Michael A. Shields, both of Sunnyvale, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 392,110, Aug. 27, 1973, Pat. No. 3,877,050. This application Jan. 22, 1975, Ser. No. 543,130

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—590 **1 Claim**



1. In a method for forming an integrated circuit having a Schottky barrier diode construction therein, providing a semiconductor body of one conductivity type and having a planar surface, forming a region of opposite conductivity type in said body extending to said surface and being substantially continuous to surround a region of said body of one conductivity type at said surface, providing a layer of insulating material on said surface, forming an opening in said layer of insulating material which has an edge which overlies said region of opposite conductivity type, forming a layer of metallization on said layer of insulating material and extending into said opening and making contact to said surface of said body, forming an additional layer of insulating material over said first layer of insulating material and over said first layer of metallization, forming a via of predetermined size in said second layer of insulating material and having an edge which overlies said region of one conductivity type circumscribed by said region of opposite conductivity type, sintering the semiconductor body and first metalization structure, forming a second layer of metallization on said additional layer of insulating material and extending there through and making contact with said first layer of metallization and again sintering said body to cause a predetermined additional bulk of metallization to be brought through said via of predetermined size and to extend between said body into contact with the first layer of metallization and further in contact with the one conductivity body portion positioned within the confines of the continuous region of opposite conductivity to form a Schottky barrier contact between said region of opposite conductivity and the body portion of one conductivity.

4,035,908

METHOD OF MANUFACTURING ELECTRIC MOTOR COMMUTATOR

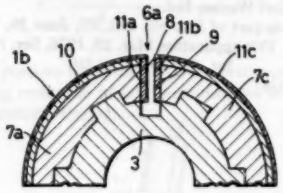
Hirohisa Ishi; Koichiro Hukui, and Norikatsu Inoue, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,589

Claims priority, application Japan, Oct. 29, 1975, 50-130202

Int. Cl.[2] H01R *43/08*

U.S. Cl. 29—597 **9 Claims**



1. In the method of manufacturing an electric motor commutator from an assembly which includes a cylindrical insulator, and a plurality of segments of commutator metal extending about the outer circumferential surface of the insulator and being spaced apart by axially extending slots opening radially outward from the insulator between confronting surfaces of the adjacent segments; the steps of shielding the circumferential surfaces of said segments, subjecting said assembly to an oxidizing treatment with said shielding on said circumferential surfaces of the segments so that only said confronting surfaces of the segments between which said slots are defined have layers of an oxide of said commutator metal formed thereon, and then removing said shielding from said circumferential surfaces of the segments for exposing said commutator metal at said circumferential surfaces of the segments.

4,035,909

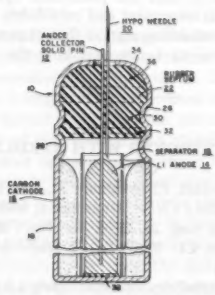
METHOD OF MAKING A MINIATURE CONCENTRIC BATTERY

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Division of Ser. No. 314,316, Dec. 12, 1972, Pat. No. 3,945,846. This application Jan. 19, 1976, Ser. No. 649,939

Int. Cl.[2] H01M *6/00*

U.S. Cl. 29—623.2 **5 Claims**



1. A method of making a miniature electric cell comprising the steps of inserting a cathode, an anode and a separator into a cylindrical metal container; inserting a sealing element into the open end of said container with said sealing element having

an unobstructed, hollow, tubular element extending therethrough; permanently sealing said container to said sealing element; introducing a fluid electrolyte from an electrolyte reservoir into said sealed container through said sealing element via said unobstructed, hollow, tubular element; separating said hollow tubular element from said reservoir and permanently preventing said electrolyte from escaping from said container via said tubular element.

4,035,910

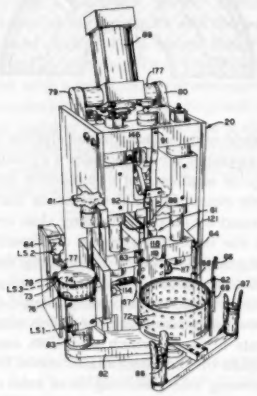
METHODS AND APPARATUS FOR USE IN MAKING ELECTRICAL INTERCONNECTIONS

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 590,707, June 26, 1975, Pat. No. 3,962,780. This application Mar. 29, 1976, Ser. No. 671,618

Int. Cl.[2] H01R *43/04*

U.S. Cl. 29—628 **4 Claims**



1. In apparatus of the type for establishing connections at a connecting station and involving at least one lead wire extending from a stator assembly, and wherein the apparatus includes at least one pneumatic cylinder and also includes connection establishing tooling, the improvement comprising: scrap collection means disposed in the vicinity of the connecting station, said scrap collection means including a confined pathway permitting the flow of fluid therealong and interconnecting the at least one pneumatic cylinder and the scrap collection means; said scrap collection means including a venturi arrangement interconnected with the confined pathway, whereby air exhausted from the at least one pneumatic cylinder is directed into the venturi arrangement and establishes a vacuum in the vicinity of the connecting station that causes debris from the connecting station to be moved into the scrap collection means.

4,035,911

SYRINGE DESTROYER WITH NEEDLE DISPOSING CANNISTER

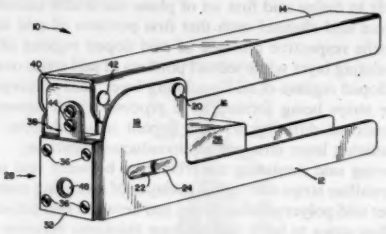
Henry W. Nethercutt, 82 Sycamore St., and Edward J. Lambiotte, 3022 Wallace Circle, Huntington, both of W. Va. 25705

Filed Aug. 23, 1976, Ser. No. 716,796

Int. Cl.[2] B26B *13/22;* **B26D** *3/16*

U.S. Cl. 30—131 **9 Claims**

1. A hand operated device for severing a hypodermic needle and its associated hub from a syringe barrel comprising an elongate base member having opposed, upstanding side walls; a front end wall assembly joining said side walls; means defining open port means in said front end wall assembly through which the needle and associated hub of a syringe assembly are inserted for severing; reciprocating blade means for severing a needle and its hub from a syringe assembly; means mounting said blade means in said front end wall assembly for reciprocating movement therein in response to hand manipulation; means defining a severing port in said blade means, cooperating with said front end open port means whereby, in one position, said ports are alligned for insertion of the needle and hub of a syringe assembly therethrough and, upon hand manipulation of



said blade means to another position, the hub and needle are severed from a syringe assembly; and removable cannister means disposed between said side walls, and having insertion port means aligned with said front end wall assembly open port means for receiving a needle and its hub during severance from a syringe assembly, said cannister means retaining said needle and hub after severance from its syringe assembly.

4,035,912

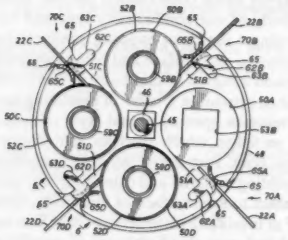
ROTARY CUTTING ASSEMBLY

George C. Ballas, and Thomas N. Geist, both of Houston, Tex., assignors to Weed Eater, Inc., Houston, Tex.

Continuation of Ser. No. 398,194, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 321,580, Jan. 8, 1973, Pat. No. 3,826,068, which is a continuation-in-part of Ser. No. 207,198, Dec. 31, 1971, Pat. No. 3,708,967. This application Nov. 19, 1975, Ser. No. 633,456

Int. Cl.[2] B26B *27/00*

U.S. Cl. 30—276 **10 Claims**



1. Apparatus for cutting vegetation and the like, comprising

a rotatable housing member having at least one metallic bearing surface adjacent its periphery,

flexible non-metallic line means interconnected with said housing member and further having a free traveling end portion extending across said metallic bearing surface and into a cutting plane, and

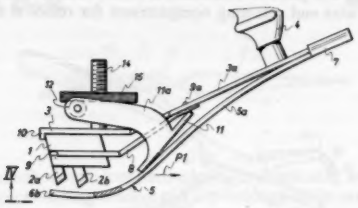
driving means for revolving said housing member to bring said line means into abutting engagement with said bearing surface therein and to substantially rigidly extend said free traveling end portion of said line means radially from said housing member for cutting vegetation in the cutting plane.

4,035,913

DEVICE FOR FORMING TRIM PATTERNS IN FUR

Josef Madl, Langbehnstrasse 20, D-82 Rosenheim, and Hans Schober, Hochriesstrasse 25, D-82 Rosenheim-Heiligblut, both of Germany

Filed July 23, 1975, Ser. No. 598,435
Claims priority, application Germany, Aug. 5, 1974, 2437694; Oct. 30, 1974, 2451528
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—287 10 Claims



1. Apparatus for trim patterning furs comprising a group of draw-knife blades arranged on a mounting plate in spaced apart generally aligned parallel relationship at substantially equal intervals adjacent each other, and being arranged with cutting edges extending at an acute angle to the base surface of said mounting plate and including an arcuate plate concave to said mounting plate base surface and having openings formed therein and being normally disposed with the convex surface of said arcuate plate adjacent the material surface to be cut, said openings defining a pass-through opening for each knife blade, and with adjustment means for establishing a desired projecting length for said knife blades over the side of the convex surface of said arcuate plate, the apparatus being characterized in that:

a. said mounting plate having an extension portion and further having a gripping handle thereon;

b. said arcuate plate having an extension portion extending generally upwardly away from the cutting edges of said draw-knife blades with said extension portion being secured to said extension portion of said mounting plate;

c. said arcuate plate extension portion being formed of a resilient material and being normally biased toward said mounting plate;

d. said knife blade adjustment means including means for spreading said arcuate plate away from said mounting plate a certain predetermined distance for simultaneously positioning the cutting edges of said draw-knife blades at a predetermined distance from the convex side of the surface of said arcuate plate, the arrangement being such that a desired projection length of the tips of said draw-knife blades is achieved.

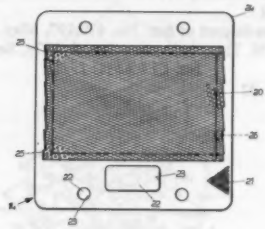
4,035,914

SHEAR FOIL FOR A DRY SHAVER

Friedrich Blume, deceased, late of Schwalbach, Taunus, Germany (by Edith Inge Blume, heir); Monika Ingrid Blume, heir, Schwalbach, Taunus, Germany; Friedrich Blume, heir, Schwalbach, Taunus, Germany; Werner Messinger, Kronberg, Taunus, Germany, and Josef Schiffer, Oberroden, Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 24, 1975, Ser. No. 634,406
Claims priority, application Germany, Nov. 25, 1974, 2455723
Int. Cl.[2] B26B *19/04*
U.S. Cl. 30—346.51 11 Claims

1. A shear foil for a dry shaver, comprising a flexible sheet material body having a central portion provided with holes of a diameter between substantially 0.3 and 0.7 mm for passage of beard stubble therethrough, and perforate peripheral shear-foil mounting portions being lateral edges and provided from the central portion up to said edges with a continuous field of holes of a diameter smaller than at least some of those in said central portion but not less than substantially 0.02 mm, the holes in the



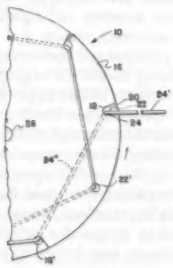
respective portions being separated by sheet material strips and the bending resistance of said sheet-material body being substantially uniform throughout.

4,035,915

FILAMENT WOUND PERFORATE PLATE SYSTEM

Charles B. Pittinger, Jr., 79 Maybin Circle, Baltimore, Md. 21117

Filed June 17, 1975, Ser. No. 587,648
Int. Cl.[2] B26B *27/00*; A01D *55/18*
U.S. Cl. 30—347 18 Claims



1. In an assembly for cutting grass and the like, including an operationally rotatable disk having structure defining a series of apertures circumferentially around the disk inside the circumference and a length of filament fixed to the disk with a terminal length thereof extending from one of said apertures as a cutting length of the filament and plural of the apertures engaging successive intermediate portions of the filament at intervals providing for each said successive intermediate portion of the filament in turn to become a said terminal length thereof extending as a cutting length on parting of a previous said terminal length thereof during operational rotation of said disk, the improvement comprising: the disk having structure defining means extending from said apertures to the circumference for receiving the broadside aspect of an intermediate length of the filament radially with respect to the disk into at least one aperture to the disk during assembly, and means communicating with said broadside aspect of the filament for preventing said intermediate length of the filament from passing radially with respect to the disk from said aperture on operational rotation of the disk.

4,035,916

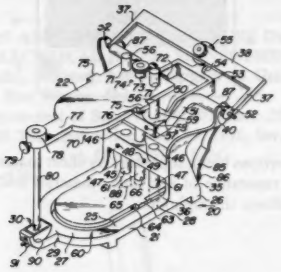
DENTAL APPARATUS

Melborne D. Eveland, 1006 Buena Vista Road, Forked River, N.J. 08731

Continuation-in-part of Ser. No. 470,197, May 15, 1974, Pat. No. 3,965,576. This application Jan. 8, 1976, Ser. No. 647,412

Int. Cl.[2] A61C *11/00*

U.S. Cl. 32—32 19 Claims



1. A dental articulator comprising a base adapted to rest on a supporting surface, upstanding medially open pedestal means on said base, a lower member in upwardly facing relation on said base for detachably carrying a lower dental model, lower member mounting means on a vertically intermediate region of said pedestal mounting said lower member for vertical adjustment relative to said base, journal bearing means at an upper region of said pedestal, an upper member extending generally from an upper region of said pedestal in downwardly facing relation over said lower member for detachably carrying an upper dental model, upper member mounting means rotatably carried by said bearing means for rotation about a laterally extending generally horizontal axis and mounting said upper member for adjustment transverse of said axis toward and away from said lower member and rotative movement with said upper member mounting means, and spring means on at least one side of said pedestal and operatively connected to said upper member mounting means for urging the latter about its axis for swinging movement of said upper member toward said lower member, said spring means leaving the medial pedestal region open for access therethrough to the dental models, said lower member mounting means comprising a fixed laterally extending member in the medial opening of said pedestal, lower way means depending from said fixed laterally extending member and slidably received in said lower member, and lower member holding means for selectively holding said lower member relative to said lower way means at a desired elevation.

4,035,917

REINFORCING DENTAL PIN CUTTER AND RETAINER

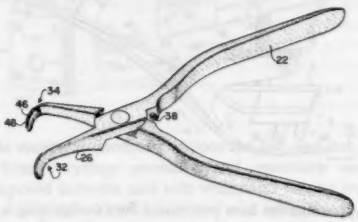
James Norman Roberts, 32206 Old Forge Lane, Farmington Hills, Mich. 48024

Filed Dec. 23, 1975, Ser. No. 643,850

Int. Cl.[2] A61C *3/00*

U.S. Cl. 32—40 R 12 Claims

1. A dental instrument for cutting and severing end portions of metal wires, pins and the like, collecting severed cuttings as cut, and containing the collected cuttings for subsequent removal, said instrument being generally of a construction similar to pliers, including pivoted handle portions and cutting jaws at the ends of the pivoted handle portions, said instrument, and principally said cutting jaws, being of a shape, size, construction and configuration for coactive insertion thereof into small spaces in a human mouth wherein wire retention pins have been inserted intra-coronally in a bore in a natural tooth to aid in retentatively adhering and reinforcing tooth restoration material applied to the natural tooth being repaired, being insertable between said pins to selectively engage an end of a said pin to sever the same, or in intra-oral surgery of a type which also includes utilization of securement wire for arch bars in a procedure to immobilize a patient's jaws, where jaw fracture exists, or for cutting and trimming wire ends in orthodontic procedures, the shape, size, construction and configuration of the cutting jaws permitting insertion and engagement of the cutting jaws about said metal end portions in severely restricted areas to permit severing the wire ends, said cutting jaws each further including, on the inner side thereof, inward facing half cup recessions matable one with the other upon closure of the jaws to constitute a totally closed and sealed severed wire end retaining compartment for removal thereof



from a mouth, said half cups having interacting and interengaging cutting edges formed on at least the forward free end edges of the cup recessions, said jaw ends being generally smoothly and continuously curvilinear, and being curved in a direction angled from the longitudinal axis of the handle portions at a substantial angle to the plane of opening of said arms, said recessions being formed in said curvilinear portions and of an elongated curvilinear generally oval shape corresponding to the shape of the jaw ends to facilitate the insertion and operation of the jaw ends within restricted areas of a human mouth, said instrument and the cutting and retaining action being operable in all positions of rotation of said instrument.

4,035,918

DENTAL INSTRUMENT

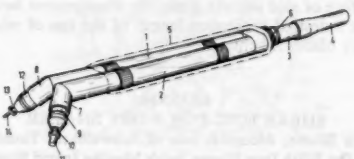
Erik François Johannes de Mul, Woerdsestraat 7, Ressen, Netherlands

Filed Dec. 23, 1975, Ser. No. 643,851

Claims priority, application Netherlands, Dec. 27, 1974, 7416952

Int. Cl.[2] A61C *3/08*

U.S. Cl. 32—54 17 Claims



1. A dental instrument for packing fillings of amalgam, including a handle with a bored head having an axially disposed bore and a first impact means which is axially reciprocable in said bore by selective contact with a driving device which is axially reciprocable within said handle, said bored head being disposed in a direction which encloses an angle with the axis of said handle, characterized in that said handle includes at least one second bored head and second impact means adapted to be axially reciprocated by said driving device, the impact direction of each said second impact means including an angle with both said axis of said handle and with the impact direction of said first impact means, said first and second impact means being each kept out of contact with said driving device by a biasing means and being separately brought

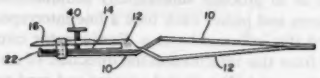
into said selective contact with said driving device by exercising a compressive force on one said bored head.

4,035,919

DIRECT BONDING BRACKET POSITIONING AND MOUNTING TOOL

Anthony J. Cusato, Closter, N.J., assignor to Dentronix, Inc., Trevose, Pa.

Filed June 4, 1976, Ser. No. 693,008
Int. Cl.² A61C *7/00*
U.S. Cl. 32—66 **10 Claims**



1. An orthodontic tool particularly for positioning and holding a direct bonding bracket as it is positioned while permitting adhering cement applied thereto to harden to secure the bracket to a tooth of a patient, said tool including: (a) a tweezer-type tool having upper and lower leg members attached at one end and as assembled there is a constructed bias so that the unconnected leg ends are movable toward and to each other; (b) an intermediate leg member carried between the upper and lower leg members and as constructed and assembled a bias is provided to urge the lower leg toward the intermediate leg, the ends of the lower leg and the intermediate leg disposed to cooperatively retain a direct bonded bracket positioned therebetween; (c) an extending jaw portion provided on the upper leg member and providing therewith a means for supporting the tool on the top of a patient's tooth as the bracket is positioned and the applied cement hardens securing the bonded bracket to the tooth; (d) a lower jaw end carried by and formed on the free end of the lower leg member, this jaw end being L-shaped and with the short portion of the L-shape extending toward the extending upper jaw, this short leg sufficient to slidably engage and enter a lower slot formed on the direct bonded bracket, and (e) adjusting means cooperatively carried by the upper and intermediate leg members whereby the intermediate leg end is positioned a selected distance from the underside of the extending upper jaw, whereby the upper and lower legs are moved by manual manipulation from each other and to open condition whereby the lower and intermediate jaw ends are sufficiently opened to place a direct bonding bracket therebetween and in a holding position whereat the legs are released to grip the bracket by the ends of the lower and intermediate legs and while gripped the adjustment means is moved as required to being the bracket to the desired position below the upper jaw.

4,035,920

DENTAL TEACHING DEVICE

Martin Saupe, Mittelbiberach, Germany, assignor to Kaltenbach & Voigt, Biberach, Rib, Germany

Filed July 8, 1976, Ser. No. 703,505
Claims priority, application Germany, July 14, 1975, 2531436
Int. Cl.² A61C *19/00*
U.S. Cl. 32—71 **11 Claims**

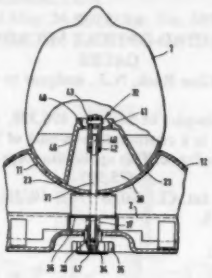
1. A dental teaching device comprising:

a dummy head;

a holder;

and means mounting the dummy head displaceably on the holder whereby the dummy head can be adjusted to any desired position relative to the holder;

wherein said means comprises a curved socket provided on said holder, and a curved rear portion of said dummy head, said rear portion engaging said curved socket so that adjustment of the relative position of the head on the holder can be carried out by relative sliding movement taking place between the curved socket and the curved rear portion;



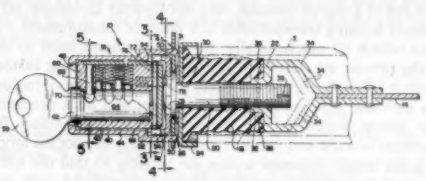
and wherein the curved socket is covered by the dummy head for all relative positions of the dummy head on the holder.

4,035,921

LOCKABLE SPOUT CLOSURE ASSEMBLY

Merton S. Williams, Terryville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sept. 22, 1975, Ser. No. 616,168
Int. Cl.² G01F *23/04*; B65D *55/14*
U.S. Cl. 33—126.7 R **17 Claims**



1. A lockable closure assembly for a spout comprising a closure member, a stud supported on said closure member for axial rotation relative thereto, means for connecting said closure member to said spout in closing relation thereto in response to axial rotation of said stud relative to said closure member, and a lock assembly including a lock housing supported at its inner end on the outer end portion of said stud for coaxial rotation relative to said stud and said closure member, said housing having an aperture in its outer end, a drive member enclosed within the inner end portion of said housing and mounted in fixed position on said stud outer end portion for rotation with said stud, a key operated lock unit wholly encased within said housing inwardly of said outer end of said housing and including a body and a key plug supported for rotation in said body, said key plug having a keyway extending in a direction generally parallel to the axis of said stud and opening outwardly through the outer end of said key plug and exposed in said aperture, said key plug being rotatable between locked and unlocked positions relative to said body in response to insertion of a proper key into said keyway and rotation of proper key relative to said body, a coupling member enclosed within the inner end portion of said housing, and means for moving said coupling member radially between uncoupled and coupled positions respectively corresponding to locked and unlocked positions of said lock unit in response to rotation of said key plug, said coupling member in a coupled position connecting said drive member to said lock unit for rotation with said lock unit and relative to said closure member in response to rotation of key, said lock unit being free to rotate within said housing and relative to said drive member when said coupling member is in an uncoupled position, said housing

being at all times free to rotate about its axis and relative to said stud and said lock unit.

4,035,922

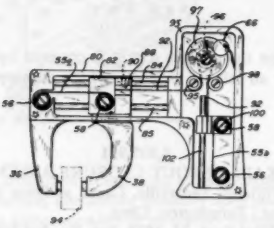
DIGITAL ELECTRO-OPTICAL MICROMETER AND GAGES

Geza von Voros, Glen Rock, N.J., assignor to Optograms, Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 496,325, Aug. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 229,944, Feb. 28, 1972, abandoned. This application Apr. 9, 1976, Ser. No. 675,597

Int. Cl.[2] G01B *7/02, 19/36*

U.S. Cl. 33—143 L **12 Claims**



1. A digital electro-optical measuring micrometer, in which the measurement is precisely determined and initiates electrical pulses fed to a digital readout, said micrometer including: (*a*) a U-shaped housing transportable to a point of measurement and within which all mechanically movable elements used to derive the precise measurement are carried, said housing further including a fixedly supported anvil; (*b*) a movable anvil including a movable bracket slidably carried by and on a precision guide means supported by the housing and providing for movement toward and away from the fixedly supported anvil, said guide means disposed within the housing so that the movable anvil is precisely movable along a prescribed path and distance which is at least a standard unit of measurement; (*c*) a constant force spring attached at one end ot the housing and at the other end to the movable bracket so as to urge the movable anvil from the maximum open condition and toward the fixedly supported anvil and with said constant force applied at all intermediate positions therealong; (*d*) a tape of relative thinness, this tape carried for movement within the housing by rollers carried by the fixed housing and with at least one end of the tape being secured to the movable member and moved with and by the movable anvil as it is moved, this movable tape being in a driving contact with a precision gage roller carried on a rotatable shaft and with this roller and shaft beng rotated as the tape is moved thereover; means for maintaining the tape at a determined tension and for providing a corresponding rotational movement of the roller; (*e*) a rotary disc-like interrupter member carried by and on the shaft on which is mounted the precision gage roller, said interrupter member precisely rotated with the movement of the tape and in response to the movement of the movable anvil against and with the bias of the constant force spring, said interrupter member having a sequence of equally spaced radially disposed lines thereon and in which the tape is also carried in a guide path and maintained in a prescribed alignment by means of first and second idler rollers with one idler roller arranged on each side of the tape path to and from the precision gage roller to provide a wrap around this roller of at least one-quarter of the circumference of said precision gage roller; (*f*) an encoder including a directed light source and at least a pair of photosensors carried by and as a part of said encoder, each photosensor adapted to receive a narrow beam of light from said source with said beam and photosensors arranged so that the lines of the radial interrupter member interrupts the beam of light as the interrupter member is moved, said interruptions as read by the photosensor being converted to electrical pulse signals; (*g*) a dash pot having a piston connected to the movable anvil and movable in said dash pot, said piston movable by and with the movement of the movable anvil and having throttling means for establihsing the maximum rotational speed of the interrupter member and the associated movable anvil in either of the two directions of movement to prevent bounce and to establish a sufficiently slow rate of the movement of the anvil whereat and whereby each and every interruption of the beam of light is distinctly read by the photosensors to insure that each and every line on the rotating interrupter member as it interrupts the beam of light converts said interruptions to an electrical pulse signal, said pair of photosensors being optically aligned so as to produce substantially simultaneously phase-shifted waves and pulses each time a line interruption occurs and to feed this information to a discriminator circuit which ascertains from this information the direction of travel at that instant of time, and (*h*) a digital counter and read-out adapted to receive said electrical signals and convert said pulse signals to information which is fed to converting apparatus with said information corresponding to the precise linear position of the movable member.

4,035,923

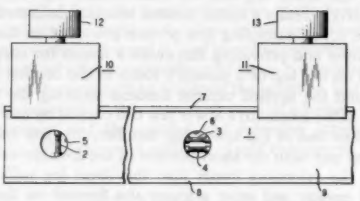
STAND-OFF ARRANGEMENT FOR LEVELS

Henry Florczak, 528 Imlay Place, Bound Brook, N.J. 08805

Filed Sept. 17, 1976, Ser. No. 724,305

Int. Cl.[2] G01C *9/00*

U.S. Cl. 33—374 **4 Claims**



1. A removable stand-off arrangement for masonry levels having I beam construction comprising:

a rectangular central member having a top aperture and a bottom longitudinal slot, said central member having in-turned end sections defining said longitudinal slot,

an integral subassembly including a pair of disc-shaped end sections joined by a cylindrical spacer section, said subassembly being partially situated inside of said central member with said cylindrical spacer section within said top aperture and one of said disc-shaped end sections confined within said central member, and

a tensioning spring wrapped about said spacer section and being in touching engagement with a top surface of said last-mentioned disc-shaped end section and an interior surface of said central member when under tension.

4,035,924

FREEZE-DRYING OF SOLID, LIQUID OR PASTE-LIKE PRODUCTS

Jean-Christian Faure, Rumilly, France, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,054

Claims priority, application France, Sept. 11, 1974, 74.30745

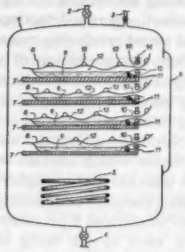
Int. Cl.[2] F26B *5/06, 13/30*

U.S. Cl. 34—5 **9 Claims**

1. A process for the lyophilisation of solid, liquid and paste-like products, which comprises the steps of:

providing an elongated container of flexible material having opposed container walls and a closeable opening at one end thereof;

introducing the container into a lyophilisation apparatus;
placing the product to be lyophilised in said container;
lyophilising said product in said apparatus while holding the container walls apart thereby to maintain said container open;



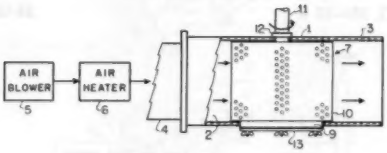
on completion of lyophilisation closing the said opening in said container; and
withdrawing said closed container from said apparatus.

4,035,925

SYSTEM FOR TREATING PARTICULATE MATERIAL WITH GASEOUS MEDIA

George E. Brown, El Cerrito, and Daniel F. Farkas, Piedmont, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 304,878, Nov. 8, 1972, abandoned. This application Oct. 24, 1975, Ser. No. 625,721
Int. Cl.² F26B *5/08*
U.S. Cl. 34—8 **3 Claims**



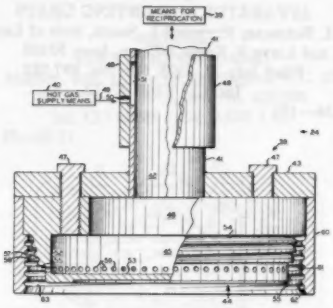
1. A process for treating particulate material with a gaseous medium, which comprises
providing a mass of particulate material,
rotating the mass while restrained by a perforated cylindrical surface at a speed at least that required to establish a centrifugal acceleration of 1 g, and to hold the major portion of the mass against the surface by centrifugal force, and
forcing a single unidirectional stream of gas through the said mass, the direction of flow within said stream being everywhere normal to a unique hypothetical plane that contains the entire axis of rotation of the perforated cylindrical surface and divides the perforated cylindrical surface into as ascending half and a descending half, said unidirectional stream entering the ascending half of the perforated cylindrical surface, then in the same direction passing through the said mass, and, finally, in the same direction exiting the descending half of the perforated cylindrical surface, maintaining the velocity of said stream of gas high enough such that about 25 to 50% of the material is formed into a fluidized mass of particles in and about the ascending half of the perforated cylindrical surface and such that the particles in and about the descending half of the perforated cylindrical surface are formed into a fixed, non-fluidized mass.

4,035,926

HEATING THE END OF A TUBULAR MEMBER

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 24, 1976, Ser. No. 689,605
Int. Cl.² F26B *3/00, 25/00*
U.S. Cl. 34—34 **24 Claims**



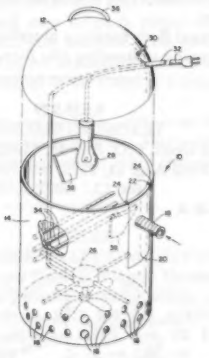
22. A method of heating the end portion of a tubular member at one end thereof which comprises directing hot gas against the inside surface of said end portion, causing said hot gas to flow along said inside surface to said end and then to flow along the outside surface of said end portion, and causing at least one of the flow of said hot gas along said inside surface and the flow of said hot gas along said outside surface to follow a spiral path.

4,035,927

PORTABLE CLOTHES DRYER

Jack Spiegel, 80 Van Courtlandt Park South, Bldg. No. 7E, Bronx, N.Y. 10463

Filed Mar. 10, 1976, Ser. No. 665,778
Int. Cl.² F26B *9/00*
U.S. Cl. 34—163 **8 Claims**



1. A portable dryer for drying articles of clothing comprising:
a rigid housing having a top and a bottom and formed with openings near said bottom;
a hose located near the top of said housing for securing at least one external hair dryer thereto for operatively supplying heated air into said housing;

a panel insertable into said housing, said hose being attachable to said panel; and

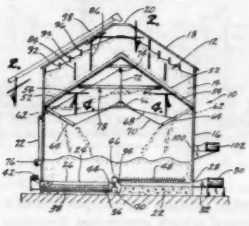
an electrically operable exhaust fan disposed within said housing, whereby heated air operatively received from the hair dryer in said housing and passing therethrough is expelled therefrom through said openings.

4,035,928

APPARATUS FOR DRYING GRAIN

Vernon H. Sietmann; Raymond L. Smith, both of Laurel, Iowa 50141, and Larry S. Keese, Gilman, Iowa 50106

Filed July 21, 1975, Ser. No. 597,582
Int. Cl.² F26B *17/12*
U.S. Cl. 34—174 **3 Claims**



1. An apparatus for drying granular material in a grain bin having an enclosure forming wall, a roof mounted over the wall, and a base floor for the wall, the apparatus comprising:

a perforated floor mounted in the upper part of the bin, said floor being inclined and sloping downwardly from the center of the bin toward and in contacting relation with the wall whereby granular material disposed on said floor is prevented from falling onto said base floor, said floor having a plurality of spaced apart openings formed therein adjacent the lower end thereof through which the granular material can fall,

said perforated floor being free from support except at said wall,

closure means operatively mounted in said bin for selectively closing said openings to vary the rate of flow of the granular material therethrough,

and means for supplying drying air within the bin and below said floor,

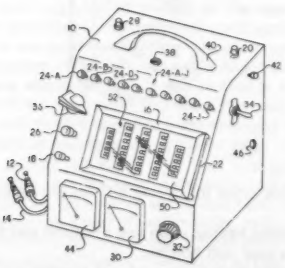
said perforated floor having a plurality of spaced apart radially extending upstanding ribs formed therein.

4,035,929

TEACHING MACHINE

James Wilson Groff, P.O. Box 38, Morgan Hill, Calif. 95037

Filed Aug. 11, 1975, Ser. No. 603,652
Int. Cl.² G09B *5/06*
U.S. Cl. 35—8 A **8 Claims**



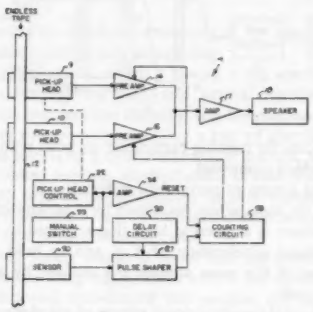
1. A portable, self-powered teaching machine for presenting audio instruction and non-multiple choice student evaluation comprising in combination: recorded sound producing means and a sound record for reproducing both audio instruction and sound producing means control signals recorded thereon; audio frequency detection and switching means to deactivate said sound producing means and sound record in response to said sound producing means control signals recorded on said sound record; audio frequency detection and switching means to deactivate said sound producing means and sound record in response to student circumvention of said sound producing means control signals by manual reduction of volume of said sound producing means; a plurality of interchangeable, coded panels displaying interrogative visual information arranged to be manually synchronized with audio instruction of said sound record; sensing means which interact with said coded panels when panels are inserted into a display area on the teaching machine's surface, thereby establishing a singular, correct student response circuit; and a plurality of student controlled switching means, each switch being identified with one or more letters of the alphabet and one or more digits, thereby allowing communication of any letter of the alphabet, A through Z, and any of the digits, 0 through 9, causing said sound producing means and sound record to be actuated by proper manipulation of said switches in response to interrogative visual information of said interchangeable panels, whereby a correct response may consist of switch manipulation to identify in the proper order the exact letters of a word, portion of a word, a numerical value, or portion of a numerical value without reference to multiple choice identification.

4,035,930

TIME SELECTIVE INFORMATION DISSEMINATION SYSTEM FOR USE IN SLEEP TEACHING

Edmund Baker Lambert, Colorado Springs, Colo., assignor to Creative Learning, Inc., Colorado Springs, Colo.

Continuation-in-part of Ser. No. 433,823, Jan. 16, 1974, abandoned. This application June 16, 1975, Ser. No. 587,075
Int. Cl.² G09B *5/04*
U.S. Cl. 35—22 R **24 Claims**



1. A time selective information dissemination system adapted for use in sleep teaching for selectively recovering information recorded on a recording medium having a predetermined rate of medium travel, said dissemination system comprising information sensing means responsive to information recorded on a recording medium and providing electrical output signals indicative thereof; signal transmitting means connected with said information sensing means for receiving said output signals therefrom, said signal transmitting means producing an output when in an enabled state and producing no output while in an inhibited state; utilization means adapted for use with a sleeping person, said utilization means being connected with said signal transmitting means for reproducing recorded information sensed by said information sensing means while said signal transmitting means is in said enabled state;

indexing means on said recording medium coextensive with the information recorded thereon; means for producing pulses in response to said indexing means at a rate correlated to the medium travel rate of the recording medium; means responsive to said pulse producing means for generating a control pulse of a predetermined time period; and dissemination control means for receiving said control pulse, said dissemination control means being connected with said signal transmitting means to enable the same automatically in response to the presence of said control pulse and for inhibiting an output from said signal transmitting means in the absence of said control pulse.

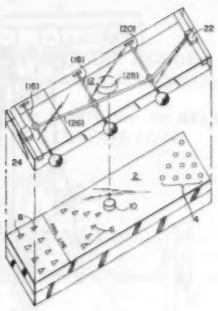
23. A method of disseminating information to a person from an endless magnetic tape while said person is sleeping, said method comprising advancing the tape at a predetermined rate of speed; initially precluding information dissemination from the tape for a predetermined period of time to allow said person to fall asleep; automatically disseminating first information from the tape in audible form to the sleeping person for a predetermined shorter period of time; automatically disseminating second information in audible form from the tape to the sleeping person; and thereafter automatically precluding information dissemination for a longer period of time relative to said information dissemination so that the intervals of information dissemination and preclusion thereof conform to a predetermined time pattern.

4,035,931

INTERCHANGEABLE LANE BOWLING CALCULATOR

Charles H. Burger, P.O. Box 86, Lovingston, Va. 22949

Filed Oct. 20, 1976, Ser. No. 734,061
Int. Cl.[2] A63B *69/00*; G09B *9/00*
U.S. Cl. 35—29 F **10 Claims**



1. An interchangeable lane bowling calculator device, comprising in combination:

A. An elongate main frame having an upper surface, with bowling lane indicia visible upon said upper surface, said indicia including a transverse foul line, and including a plusality of lane spots and a plurality of bowling pin positions both spaced longitudinally and transversely across said upper surface, wherein said foul line, lane spots and pin positions are respectively spaced longitudinally along said upper surface, a registration pin extending upwardly from said upper surface at a longitudinal position between said lane spots and said pin positions, and;

B. A first optically transparent elongate and box-like cover assembly adapted to be placed upon said upper surface, and including a recess on the underside of said cover adapted to receive said registration pin and allow for movement of said cover both longitudinally and transversely with respect to said main frame, and;

C. A second optically transparent elongate and box-like cover assembly adapted to be placed upon said upper surface, said second cover also including a recess as defined for said first elongate cover, and;

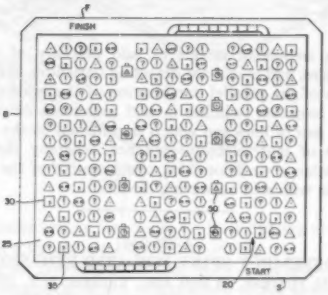
D. An elastic member extending longitudinally within each of said first and second elongate covers, said elastic member having a means for transverse position adjustment at a plurality of points spaced along its longitudinal extent, whereby a characteristic ball curvature may be defined for each of two distinct bowling lanes by separate adjustment of the elastic member within each of said covers, and said covers may be interchanged upon said elongate main frame carrying said bowling lane indicia.

4,035,932

EDUCATIONAL GAME

Janet E. Massey, Rte. 1, Box 68, Burlington, N.C. 27215

Filed Nov. 5, 1975, Ser. No. 629,008
Int. Cl.[2] G09B *1/04*; A63F *3/00*
U.S. Cl. 35—35 D **3 Claims**



1. An educational game comprising:

a. a playing board having thereon a designated path for progressive movement of players, said path comprising a starting point, a finish point and a plurality of successive landing areas therebetween, each landing area including therein a plurality of various landing positions arranged in a predetermined order, each of said landing positions being designated by a distinct geometric shape, said positions arranged in a row extending transversely to said designated path, said predetermined order varying in successive landing areas;

b. a plurality of question cards one of said cards being utilized during each turn of each player for determining player movement, said question cards having a question on one side and the corresponding answer, as well as directions as to movement in the event of a correct answer on the other side;

c. a playing piece for each player, said pieces being moved to one of said geometric shapes in a designated row responsive to the directions on said other side of said question cards.

4,035,933

RESPONSE ANALYZING DEVICE

Kiyomi Abe, Noda, and Genichi Tagata, Hamamatsu, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed Nov. 14, 1973, Ser. No. 415,833
Claims priority, application Japan, Apr. 12, 1973, 48-41650; June 4, 1973, 48-62691
Int. Cl.[2] G09B *5/00*
U.S. Cl. 35—48 R **9 Claims**

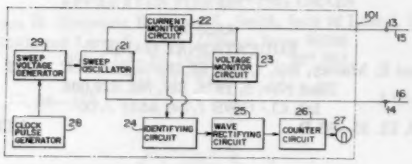
1. A response analyzing device comprising:

a plurality of answering devices each comprising a series resonant circuit and a selection switch in series with said resonant circuit and operable to an open and a closed condition for responding to a question, and wherein the resonance frequencies of the resonant circuits in said plurality of answering devices are mutually different;

a pair of lines electrically connecting in parallel the series

combinations of the resonant circuit and selection switch in each of said plurality of answering devices; and

a master unit comprising a sweep frequency oscillator for applying an oscillatory output signal, having a frequency continuously varying over a frequency range within which the resonance frequencies of said series resonant circuits lie, to said pair of lines connecting the parallel combination of the resonant circuit and selection switch in



each answering device of said plurality of answering devices, and means for detecting variations in the impedance of the parallel combination of the resonant circuits and selection switches in said answering devices across said pair of lines and which are effected by the closure of ones of said selection switches, whereby the detected impedance variations are representative of the responses made with said answering devices.

4,035,934

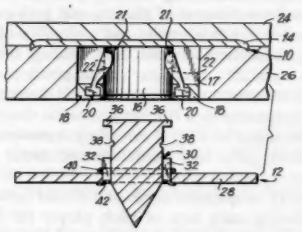
ASSEMBLY SPIKE FOR ATHLETIC SHOE

Andrew N. Hrivnak, 56 Ball Ave., Yonkers, N.Y. 10701

Filed Aug. 26, 1976, Ser. No. 717,578

Int. Cl.[2] A43C *15/00*; A43B *5/00*

U.S. Cl. 36—67 D **5 Claims**



1. An athletic shoe spike construction comprising a spike receiving assembly and a spike assembly, said spike receiving assembly including a spike receiving member defining opposed side slits and a pair of opposed springs each defining a top-shoulder normally protruding into said spike receiving member through said slits and said spike assembly including a spike member defining side spike removal channels and a top flange, said spike member being insertable and removable to said spike receiving member with insertion by passing into said spike receiving member, said top flange moving said springs apart and said top flange on said top shoulders to retain said spike member is fully inserted position with respect to said spike receiving member.

4,035,935

LAWN AERATING ATTACHMENTS FOR SHOES AND BOOTS

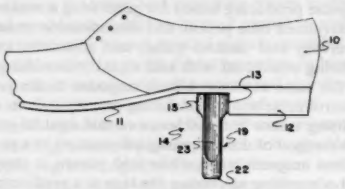
Robert Forrest, Winnipeg, Canada, assignor to Forrest Tool & Die Limited, Winnipeg, Canada

Filed Dec. 16, 1976, Ser. No. 751,044

Int. Cl.[2] A43B *23/00*

U.S. Cl. 36—136 **8 Claims**

1. A lawn aerating attachment for boots and shoes which includes a sole, a heel undersurface and a vertical riser between the front of the heel undersurface and the rear of the sole; comprising in combination a cross bar securable to the sole adjacent the vertical riser, and a plug cutting tube secured at each end of the cross bar and extending downwardly there-



from, each of said tubes including an edge sharpened lower end and means to facilitate discharge of earth plugs cut by said tubes, upwardly from said tubes.

4,035,936

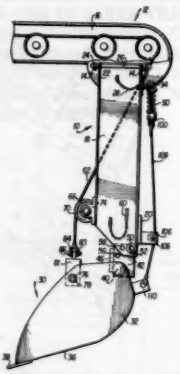
EXCAVATOR ATTACHMENT FOR BOOM STRUCTURE

Teddy Walter Avara, 101 McRaven St., Clinton, Miss. 39056

Filed July 1, 1976, Ser. No. 701,681

Int. Cl.[2] E02F *3/46*

U.S. Cl. 37—116 **18 Claims**



1. An excavating device capable of being reversably attached to the end of any conventional machine mounted boom structure having a power driven winch cable associated therewith, said device comprising:

a. first and second sets of spaced appart mounting elements, one set of each of said elements being capable of being secured to opposite sides of the end of said boom structure,

b. a pair of spaced apart, downwardly depending bucket arms, one end of each of said arms being detachably secured between one set of said mounting elements, and

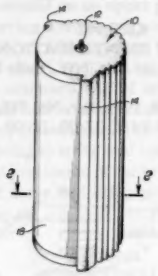
c. bucket means pivotably mounted between the other end of said pair of spaced apart bucket arms, said bucket means being operatively connected to said winch cable such that when said bucket arms are attached to said mounting elements in a first mode, said bucket means is capable of digging away from said machine and when said bucket arms are attached to said mounting elements in a second mode, said bucket means is capable of digging toward said machine.

4,035,937

CANDLE WITH INTEGRAL CARD HOLDER

Arthur Rosenfeld, 5016 W. Jefferson Blvd., Los Angeles, Calif. 90016

Filed May 10, 1976, Ser. No. 684,554
Int. Cl.[2] G09F 3/18
U.S. Cl. 40—16.4 3 Claims



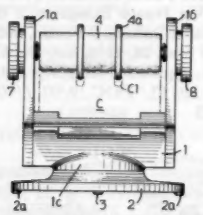
1. A candle having formed in the periphery thereof circumferentially spaced, vertical, opposed grooves which face each other circumferentially and which are respectively adapted to receive vertical edges of a card, or similar article.

4,035,938

ROTARY CARD HOLDER

Hildaur L. Neilsen, Metuchen, N.J., assignor to Rolodex Corporation, Secaucus, N.J.

Filed May 5, 1976, Ser. No. 683,316
Int. Cl.[2] G09F 11/02
U.S. Cl. 40—68.6 8 Claims



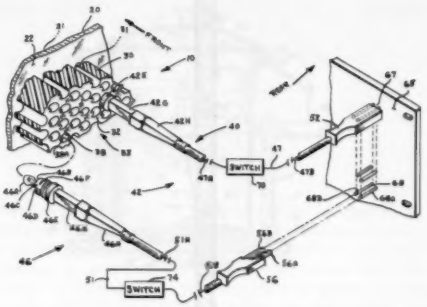
1. A rotary card holder comprising a case having spaced upright supports with inner and outer faces, a rotor disposed between said supports and having means for holding a plurality of cards, said rotor having shaft portions extending axially from opposite ends of said rotor and rotatably supported by said supports to mount said rotor rotatably in said case, at least one of said shaft portions projecting beyond the outer face of the respective support, an annular boss on the outer face of said respective support surrounding said projecting shaft portion, a knob fixed on said projecting shaft portion for manually turning said rotor, said knob having an annular flange portion surrounding said boss, and spring means acting between said flange portion and said boss frictionally to resist rotation of said knob and rotor, whereby said rotor is frictionally retained in a position to which it has been manually turned by said knob, said spring means comprises a spring having end portions bearing on the inside of said flange portion and an intermediate portion bearing on said boss.

4,035,939

LIGHTING SYSTEM FOR SELECTIVE BACK LIGHTING

Thomas F. Dadian, Santa Paula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,527
Int. Cl.[2] G09F 13/04
U.S. Cl. 40—132 D 6 Claims



1. A lighting system for selectively back lighting preselected portions of a translucent object, comprising:

a. means for removably holding, supporting, and displaying said translucent object, wherein said means includes a flat translucent component having a front surface, on which said translucent object is removably held, supported and displayed, and a rear surface;

b. a core matrix having a front surface abutting said rear surface of said flat translucent component, and also having a rear surface, wherein said core matrix includes a plurality of identically configurated openings therethrough, with each said opening having a nodule therein, with each nodule being identical and also being identically situated within each opening;

c. and, a lighting assembly disposed essentially rearward of said rear surface of said core matrix, and in operative association with said core matrix, wherein said lighting assembly includes:

1. a plurality of identical lamp subassemblies, one for each said core matrix opening, with each one of said plurality of identical lamp subassemblies having an identical lamp, with each said lamp dimensioned and shaped to fit into any one of said plurality of identically configurated openings in said core matrix;

2. and, means for selectively energizing any lamp of said plurality of identical lamps of said plurality of identical lamp subassemblies.

4,035,940

SIGN CONSTRUCTION

Edgar G. Mickey, and Gerald H. Nelson, both of Houston, Tex., assignors to Micknel Manufacturing Inc.

Filed Jan. 8, 1976, Ser. No. 647,426
Int. Cl.[2] G09F 7/08
U.S. Cl. 40—140 3 Claims

1. A laminated two-face sign construction comprising:

a. a core block of substantially rigid slightly resilient compressible foam material;

b. thin metal sheets affixed to opposite sides of said core block and substantially covering the entire surface thereof;

c. U-shaped channel members extending along the upper and lower edges of said core block with the core block slightly compressed and inserted into such U-shaped channel members for holding the upper and lower edges of sheet letters inserted into such channel members on either face

of the sign and between such channel member and the adjacent face of the core block with longitudinally extending grooves in the upper and lower edges of said core block to facilitate insertion of letters in said channel members,

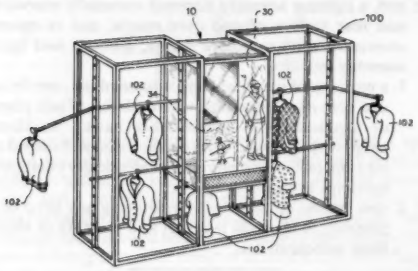
said sign comprising at least two said core blocks joined together so as to form at least two rows of indicia on either face thereof.

4,035,941

AUDIO-VISUAL DISPLAY DEVICE

John F. Deffner, Lisle, Ill., assignor to Visual Marketing Incorporated, Chicago, Ill.

Filed Nov. 26, 1975, Ser. No. 635,277
Int. Cl.[2] G09F *13/12*
U.S. Cl. 40—219 **9 Claims**



1. A display device for audio and visual merchandise promotion comprising:

a. a display enclosure comprising:

1. at least first and second compartments each having an illumination means therein;
2. at least one wall forming a side of the first and second compartments, the wall composed of a transparent mirror having the characteristic of reflecting visible light radiation when the illumination means is not activated and transmitting visible light radiation when the illumination means is activated;
3. at least one pictorial representation of merchandise on the inside of the wall;

b. an audio means including at least one audio tape; and

c. a timer means for regulating a cyclic sequential actuation of the illumination means in each of the first and second compartments and the actuation of the audio means said time means adapted to produce a cycle including a period of activation of said illumination means wherein said transparent mirror transmits visible light and said pictorial representation is observable through said transparent mirror and a period without activation of said illumination means wherein said transparent mirror reflects visible light and said pictorial representation is not observable through said transparent mirror.

4,035,942

BULLET IDENTIFICATION

Sol B. Wiczer, 1000 Vermont Ave., NW., Suite 804, Washington, D.C. 20005

Filed June 30, 1976, Ser. No. 701,244
Int. Cl.[2] F41C *27/00, 21/00*
U.S. Cl. 42—1 A **10 Claims**

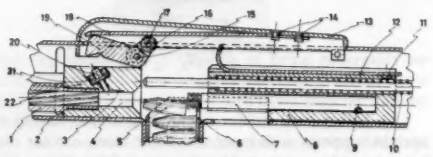
1. A system for identifying a bullet with a gun having a barrel bore through which the bullet was fired comprising mounting marking elements in said barrrel bore capable of imparting markings upon the bullet surface as it passes said elements in surface contact therewith, said marking elements being arranged to apply markings to the bullet surface as identifying insignia visibly readable on said surface to identify said bullet with corresponding identifying indicia upon the gun from which said bullet was fired.

4,035,943

RADIAL PERCUSSION ARRANGEMENT FOR FIREARMS USING SELF-PROPELLING AMMUNITION WITH PERIPHERIAL PRIMING

Bruno Civolani, Via Franco Bolognese, 2 Bologna, and Paolo Benelli, Via Cesare Battisti, 9 Pesaro, both of Italy

Filed Mar. 26, 1976, Ser. No. 670,989
Claims priority, application Italy, Apr. 14, 1975, 44008/75
Int. Cl.[2] F41C *19/00, 11/00*
U.S. Cl. 42—69 B **6 Claims**



1. A radial percussion arrangement for firearms using self-propelling projectiles with peripherial priming comprising

a receiver including a breech unit mounted therein;

a projectile chamber extending longitudinally within an intermediate part of said breech unit;

a bore located within said breech unit, said bore inclined downwardly and rearwardly and in communication with said projectile chamber;

a firing pin mounted for free sliding movement within said bore, said firing pin having an upper portion, and said firing pin further having a lower tip portion projecting into said projectile chamber when there is an absence of a projectile therein;

a hammer pivotally mounted on said receiver, said hammer having a forward end extending on one side of said pivot

and a rearward end extending on the other side of said pivot;

a longitudinally movable bolt located rearwardly of said receiver, said bolt including a locking rod mounted thereon for contacting and introducing a projectile into said projectile chamber as said bolt is moved forwardly to contact said breech;

a flat spring mounted on an upper portion of said bolt, said flat spring having a front end portion for contacting said rearward end of said hammer as said bolt moves forwardly, said front end portion located to be able to contact said rearward end of said hammer prior to the contact of said bolt with said breech; and

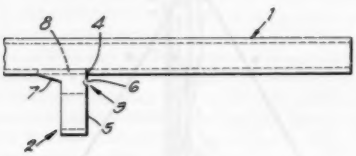
said forward end of said hammer pivotable upon said contact of said flat spring to strike said upper portion of said firing pin and effect percussion of the projectile in said projectile chamber and move said firing pin upwardly in said bore.

4,035,944

GUN BARRELS

Georges A. Gevers, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A. en abrege FN, Herstal, Belgium

Filed July 6, 1976, Ser. No. 702,507
Claims priority, application Belgium, Sept. 26, 1975, 254586
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—75 B **5 Claims**



1. In gun barrels of the type provided with a fixing and guiding ring having a base which is secured to the barrel by welding or brazing and having a surface transverse to said barrel, the improvement comprising:

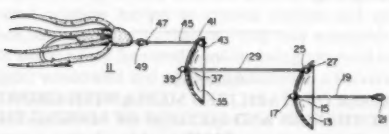
a groove extending transversely of said surface and said barrel, closely adjacent said barrel.

4,035,945

RANDOM MOTION FISH LURE APPARATUS AND METHODS

Gerald R. Newman, 78 Eventide Lane, Levittown, Pa. 19054

Filed June 22, 1976, Ser. No. 695,313
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.15 **8 Claims**



1. Motion control apparatus for interconnection between a fishing bait and a fishing line for imparting unique motion to the bait when drawn through the water, comprising in combination:

a pair of concave discs;

means for connecting the center of one disc to the line;

means for connecting the other disc at its center to said one disc adjacent its edge; and,

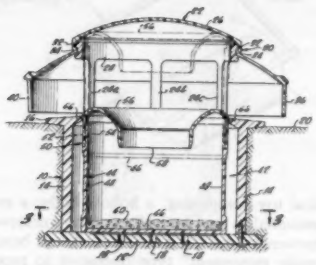
means for connecting a bait to said other disc adjacent its edge.

4,035,946

TRAP FOR SLUGS AND SNAILS

Wallace Thomas Rapp, 402 W. St. Gertrude Place, Santa Ana, Calif. 92707; Wallace A. Rapp, and Gertrude A. Rapp, both of 803 W. 10th St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 634,867, Nov. 24, 1975, abandoned. This application June 24, 1976, Ser. No. 699,217
Int. Cl.[2] A01M *25/00*
U.S. Cl. 43—131 **18 Claims**



1. A pest trap comprising

an outer container,

an inner buoyant container within said outer container, and

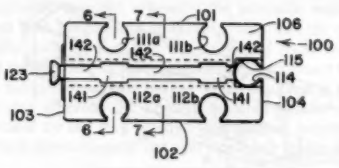
means for providing a pest access path to the interior of said inner container.

4,035,947

TOY CONSTRUCTION SET HAVING INTERCONNECTIBLE COMPONENTS WITH INTERFITTING FORMATIONS

David A. Burge, 3594 Glencairn Road, Shaker Heights, Ohio 44122

Filed Aug. 21, 1975, Ser. No. 606,348
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—25 **9 Claims**



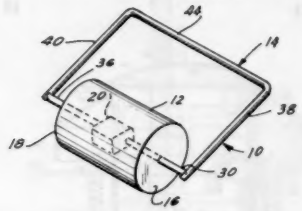
1. A construction set including a pair of components having engageable interfitting formations configured to securely releasably connect the components when such formations are interfittingly engaged, the formation on one component including projection means projecting substantially transversely from a face on the one component and being undercut in directions extending substantially transversely of such face, the formation on the other component including recess means having two recess portions one of which is undercut and adapted to slidingly engage the undercut projection means when the components are moved relatively to slide the one recess portion parallel to such face and into sliding engagement with the undercut projection means, the other of which is configured to receive and releasably retain the undercut projection means when the components are moved relatively transversely of such face to interfittingly engage the other recess portion and the undercut projection means, the two recess portions being arranged side-by-side and being associated with a common face of the other component.

4,035,948

MUSICAL TOY

Harry Fishbein, New York, N.Y., assignor to Swisstone Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,182
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—189 **12 Claims**



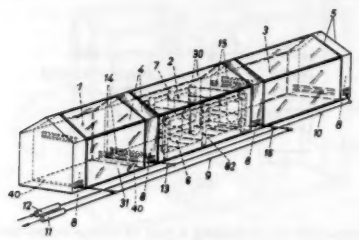
1. A musical toy comprising, a hollow body; a music box movement mounted in said body for rotation therewith; said music box movement having a drive shaft and being of the "left-right music movement" type operative to produce the desired melody in either direction of rotation of the drive shaft; said drive shaft extending from said music box movement along an axis of rotation of said body and through said body; and means rigidly secured to said drive shaft for holding said shaft against rotation, whereby rotation of said body of revolution about said axis of rotation will cause said music box to rotate about the drive shaft and produce the desired melody regardless of the direction of rotation of said body.

4,035,949

INSTALLATION FOR REARING PLANTS

Othmar Ruthner, 150 Sieveringerstrasse, A-1190 Vienna, Austria

Filed May 6, 1975, Ser. No. 574,847
Claims priority, application Austria, May 6, 1974, 3727/74
Int. Cl.[2] A01G *9/00*
U.S. Cl. 47—17 **4 Claims**



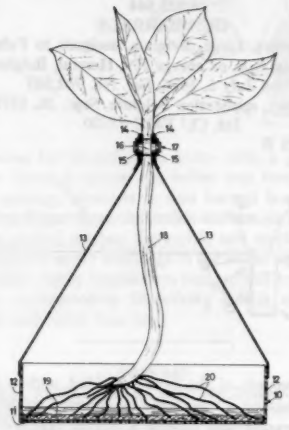
1. An installation for rearing plants, comprising a plurality of successive, independent culture chambers, each of said culture chambers including endless circulating support means on which plants are moved through zones in said chambers under controlled environmental conditions, each of said culture chambers being confined at each end by an end wall panel which has the same configuration as the vertical transverse section of the culture chamber, said end wall panels of each culture chamber being connected by side and roof panels which connect the peripheral edges of the end wall panels and laterally confine the culture chamber, said culture chambers further including reversing pulleys, said endless circulating support means comprising a serpentine, meandering belt having downwardly extending loops which are freely suspended from said reversing pulleys without being constrained about pulleys at their lower ends, said belt comprising two laterally spaced revolving chains interconnected by a series of spaced carriers extending transversely between said chains, said carriers serving to support the plants to be reared, and at least one manipulation chamber defining an enclosed area interposed between adjacent end wall panels of adjacent culture chambers for accommodating means to control the conditions in the culture chambers and the treatment of the plants.

4,035,950

CHANNEL-LIKE STRUCTURE FOR HORTICULTURE AND FLOWER-GROWING

Anthony Cesar Anselm, Casa Clarita, Molcote, Lugano, Switzerland

Filed Feb. 27, 1976, Ser. No. 662,046
Claims priority, application Italy, Feb. 27, 1975, 20746/75; Oct. 10, 1975, 28169/75
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—59 **28 Claims**



1. A channel-like structure for horticulture and flower-growing, of the kind in which the plants to be grown are arranged in the interior of a tubular member so that the roots are in continuous contact with liquid nutrient solution, characterized in that said structure comprises a central core of a plastic material adapted to form in use a channel-like member, two side strips of a non-rigid plastics material having their origin, each, from an edge of the central core, said side strips having such a width as to be able to be at least partially superposed to one another in correspondence with the central line of said channel-like member, the inner surface of said central core forming the bottom wall of said structure is lined by a layer of a fibrous material.

4,035,951

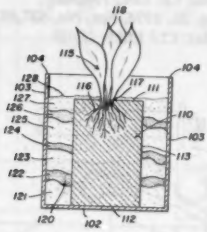
CONTAINER OF STABILIZED MEDIA WITH GROWING PLANT THEREIN AND METHOD OF MAKING THE SAME

Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.

Filed Aug. 11, 1975, Ser. No. 603,755
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **48 Claims**

1. A container of stabilized soil mix comprising a fluid-tight container open at the upper end thereof, a body of soil mix in said container, and a quantity of foam-forming synthetic organic plastic resin distributed throughout said body of soil mix, said quanity of synthetic organic plastic resin being reacted in

situ to form an open-celled hydrophilic polymer binding said body of soil mix into a cohesive mass and to the adjacent inner



surfaces of said container, said soil mix comprising at least 96% by weight of said cohesive mass.

4,035,952

LOUVERED WINDOW LOCK

Bernard H. Brantner, 14255 Tyler St., Sylmar, Calif. 91342

Filed Aug. 23, 1976, Ser. No. 716,544
Int. Cl.[2] E06B *7/086*
U.S. Cl. 49—74 **5 Claims**

1. In combination with a louvered window which consists of a plurality of overlapping glass panels, said glass panels being pivotally connected to an actuation mechanism, said actuation mechanism being manually operable to cause pivoting of said glass panels between a closed position and an open position with spaces being formed between adjacent glass panels, said louvered window having an outside surface and an inside surface, said actuation mechanism being only actuatable at said inside surface, said louvered window being mounted between an upper windowsill and a lower windowsill, a louvered window lock comprising:

an elongated bar having an upper end and a lower end, said upper end of said bar to be located directly adjacent said upper windowsill, said lower end of said bar to be located directly adjacent said lower windowsill attaching means to secure said lower end of said bar to said lower windowsill;

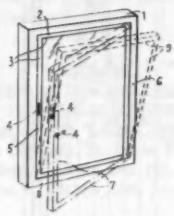
a plurality of brackets secured to said bar with said brackets being spaced apart, each said bracket to be in contact with the upper edge of a said glass panel with there being a separate bracket for each said glass panel, whereby with said bar secured in place upon said lower windowsill and each bracket being in contact with the upper edge of a said glass panel that it is not possible for one to remove intact any one of the glass panels.

4,035,953

HINGE AND HINGE AND PIVOT ARRANGEMENT

Johannes Harald Bierlich, Oresundshoj 15, Charlottenlund, Denmark

Filed July 7, 1976, Ser. No. 703,295
Int. Cl.[2] E05D *15/52*
U.S. Cl. 49—192 **6 Claims**



1. A hinge and pivot arrangement for a movable member, for example a window sash, and a co-operating frame, the arrangement including two hinges arranged at opposite ends of one member of the frame whereby the movable member can be hinged about said one frame member, a bolt co-operating with means for releasably connecting one of said hinges to the movable member, at least one striker plate on another member of the frame, opposite to the said one frame member, a stay pivoted at one end to said another frame member, and an operating mechanism mounted on the movable member and including an operating handle, an operating rod movable by the handle and carrying a locking member and a pin engagable in a channel in the free end of the stay and a linkage connecting the bolt and the operating rod, wherein in a first position of the operating handle, the locking member engages the striker plate thereby to secure the movable member to the frame against opening, in a second position of the operating handle, the locking member is disengaged from the striker plate and the bolt and co-operating means connect the said one of the hinges to the movable member whereby the movable member can turn about both hinges, and in a third position of the operating handle, the locking member is disengaged from the striker plate and the bolt and co-operating means disconnect the hinge from the movable member and the pin is engaged in the channel of the stay whereby the movable member can tilt within the limit imposed by the stay relative to a further member of the frame which interconnects the said opposing frame members.

4,035,954

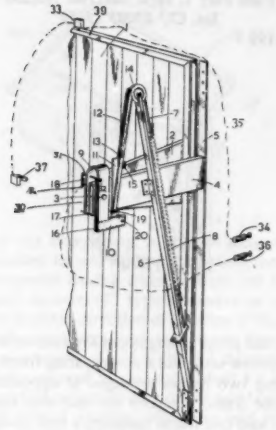
GARAGE DOOR ASSEMBLIES

Ivar Hoff, 7080 Heimdal, Norway

Continuation-in-part of Ser. No. 496,130, Aug. 9, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,161
Claims priority, application Norway, Aug. 24, 1973, 733340
Int. Cl.[2] E05D *15/40*
U.S. Cl. 49—203 **6 Claims**

2. A garage door assembly comprising in combination: a frame means for receiving a door mounted for overhead swinging movement and for providing rigid support for door suspension and opening and closing levers; a single spring element designed for extension between spaced apart points and having one end thereof secured to the frame means; a system of levers comprising at least first and second levers connected together in series, said first lever being connected to an opposite and remaining free end of said spring element, being mounted for restrained movement in one direction as restrained by a releasable locking device as well as for unrestrained pivotal movement in an opposite direction and being

pivotally mounted at a location spaced from said locking device to provide pivotal support for said second lever which is itself pivotally mounted between its opposite ends; a pivotable door support member secured to said door and operatively associated with said lever system to enable said spring element to furnish torque for either opening or closing the door by



pivotally moving said levers of said system to and fro thereby altering the leverage ratio; and said releasable locking device being adapted to cooperate in its locked position with said second lever substantially to prevent pivotal movement thereof from a position in which the door is closed to a position in which the door is open or vice-versa.

4,035,955

BOOM GATE

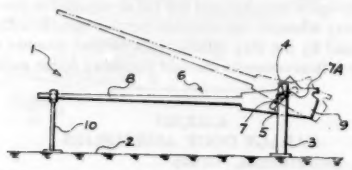
David Burnett, 29 Albion St., Surry Hills, Sydney, New South Wales 2010, Australia

Filed Mar. 14, 1975, Ser. No. 558,712

Claims priority, application Australia, Jan. 23, 1975, 0350/75

Int. Cl.[2] E05F *1/00*

U.S. Cl. 49—280 **9 Claims**



1. A boom gate comprising a support pillar, bearing means on said pillar, a first-class lever pivotable about said bearing means and having a first end-portion, forming a boom to be raised and lowered, and a second end-portion providing a counterweight, giving the lever a center of gravity disposed adjacent a fulcrum axis for the lever provided by said bearing means, and fulcrum displacement means operable to displace said lever lengthwise with respect to said bearing means, whereby the center of gravity is transferred from one side of the lever fulcrum axis to the other side to turn the lever by its own weight around the axis, wherein said fulcrum displacement means include a piston and cylinder unit, a source of pressure fluid, valving for connecting the pressure fluid source to said piston and cylinder unit to operate the boom gate, and latching means controlled by said boom.

4,035,956

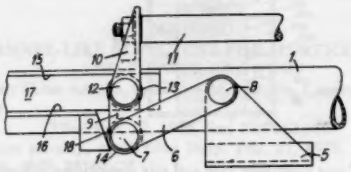
DRIVING AND LOCKING MECHANISMS

John Chase Newson, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Filed Aug. 25, 1975, Ser. No. 607,592

Int. Cl.[2] E05F *15/00*

U.S. Cl. 49—280 **7 Claims**



7. A driving and locking mechanism for a door operator for coupling the driving member of an actuator to a driven member in the form of a sliding door movable between open and closed positions, said mechanism comprising first and second links for coupling the driving member to the door so as to transmit movement therebetween; pivot means for mutually pivotally coupling said first and second links; and track means, including guide surfaces cooperating with guide surfaces associated with said links; for constraining said links to remain in a first, predetermined relative position over a range of movement of the driving and driven members wherein said door is driven by said driving member, said mechanism further comprising abutment means located adjacent a terminal end of said track means, and said terminal end of said track means providing freeing of the links from the constraint provided by said track means when said driving and driven members are at a location outside of said range of movement so as to enable a pivotal movement of said links away from said first predetermined relative position into a second, substantially oververtical locking position relative to a vertical reference wherein said abutment means engages said links at the location of said pivot means, thereby preventing movement of said mechanism from said locking position by a force other than that provided by said driving member.

4,035,957

ENTRY OR PASSAGE DOOR, ESPECIALLY FOR SHOWER STALLS

Heinz-Rudolf Roloff, Marseillestrasse 53, D-4156 Willich - 1, Germany

Filed Apr. 15, 1976, Ser. No. 677,126

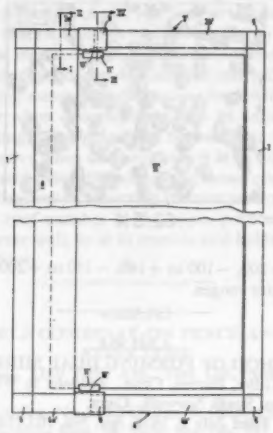
Claims priority, application Germany, Apr. 17, 1975, 2517038

Int. Cl.[2] E05D *7/08*

U.S. Cl. 49—388 **13 Claims**

1. Entrance or passage door, especially for shower stalls comprising a frame of rust free material, said frame including spaced parallel vertical members and spaced parallel horizontal connecting members, said connecting members each including a pair of telescoping elements adjustable in one another for varying the width of said frame, means for locking said elements in positions, a stationary door panel mounted on one of

said vertical members, a hinged door panel overlapping said stationary door panel at least slightly, and hinge means on one



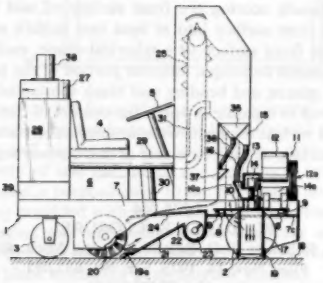
of said connecting elements of each of said connecting members for pivotally mounting said hinged door panel.

4,035,958

MOBILE FLOOR CLEANING AND POLISHING DEVICE

Takuji Nishio, Tokyo, Japan, assignor to Tokyo Kosei Kaken Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 440,057, Feb. 6, 1974, abandoned. This application July 11, 1975, Ser. No. 595,114
Claims priority, application Japan, Mar. 30, 1973, 48-36509
Int. Cl.[2] B24C *3/00*
U.S. Cl. 51—425 16 Claims



1. In a mobile surface cleaning and polishing machine, a chassis having a longitudinal axis, ground-engaging wheels journaled to said chassis for supporting the same for translation in the direction of said axis, said chassis including a horizontal plate having a central opening therethrough, a turntable, means mounting said turntable on said plate for limited turning about a vertical axis normal to said plate, over said opening, a nozzle having a generally rectangular discharge orifice, said nozzle being fixedly mounted on said turntable to depend therefrom, with said discharge orifice closely spaced from and above a surface to be treated, a reservoir for abrasive material carried by said chassis, an impeller journaled on said turntable and rotatable to impel material from said reservoir through said nozzle, to and out of said orifice, and power means carried by said chassis, connected to rotate said impeller,

a cylindrical brush journaled on said chassis for rotation on a horizontal axis extending transversely of said chassis, and engageable with a surface being treated, rearwardly of said nozzle, an upwardly-inclined chute having an intake opening contiguous to said brush and including a channel at its top transversely of said longitudinal axis, conveyor means in said channel operating to convey to one end thereof, material impelled by said brush, elevator means cooperating with said conveyor means, to elevate accumulated material for flow by gravity into said reservoir,

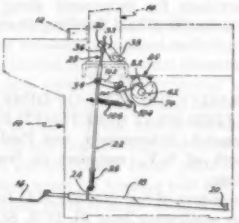
a compartment mounted on said chassis and adapted to contain a filter element for dust, a blower connected to exhaust air from said compartment, a main duct conducting air from said reservoir to said compartment for filtering dust therein, and a branch duct connected between said chute and said main duct.

4,035,959

CAM OPERATED AUTOMATIC CONTROL FOR A HONING MACHINE

Frank E. Vanderwal, Jr., St. Louis County, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Sept. 20, 1976, Ser. No. 724,586
Int. Cl.[2] B24B *5/08, 51/00*
U.S. Cl. 51—34 K 12 Claims



1. In a honing machine having a mandrel with a radially movable work engaging member mounted thereon and means for radially moving said work engaging member into engagement with a cylindrical work surface to be honed, the improvement comprising cooperatively engageable cam and cam follower members one of which is operatively connected to the work engaging member for controlling the rate of radial movement thereof into engagement with the cylindrical work surface, means responsive to a predetermined relationship between the cam and cam follower members to establish a condition to maintain the work engaging member engaged with the work surface independently of the cam and cam follower members, and means responsive to a predetermined honed condition of the work surface to automtically terminate the honing operation, said last named means including means to enable the work engaging member to move out of engagement with the work surface.

4,035,960

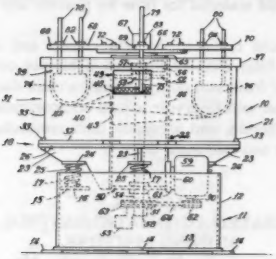
FINISHING APPARATUS HAVING PART-ISOLATING MEANS WHICH CONFINES OR MAINTAINS CONTENTS IN INDIVIDUAL COMPARTMENTS AND IS CARRIED ALONG BY SAID CONTENTS

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Continuation of Ser. No. 414,656, Nov. 12, 1973, Pat. No. 3,981,693. This application Jan. 14, 1976, Ser. No. 649,087
The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.
Int. Cl.[2] B24B *31/06*
U.S. Cl. 51—163.1 21 Claims

1. Apparatus for treating the surface of parts or workpieces with loose finishing material while maintaining parts isolated from other parts and to prevent damage to parts as a result of

collision therebetween, having a resiliently-supported vibratory finishing chamber in which the parts are vibrated with the finishing material, characterized in that the part-isolating means comprises partitions for separating the interior of the finishing chamber into individual compartments defined by adjacent partitions, which partitions are solid and essentially



correspond to the cross-section of the finishing chamber to confine and maintain both a part or parts and loose finishing material therein; means for supporting said partitions for vibration movement with said finishing chamber and means supporting said partitions for movement along said finishing chamber by the contents of said finishing chamber.

4,035,961

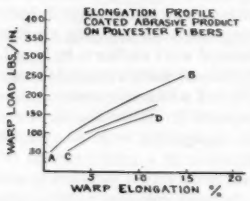
COATED ABRASIVE BACKING OF DIMENSIONALLY STABILIZED HEAT STRETCHED FABRIC

Raymond E. Pemrick, Schenectady, and Paul M. Cocanour, Greenwich, both of N.Y., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 491,354, July 24, 1974, abandoned. This application June 27, 1975, Ser. No. 590,989

Int. Cl.[2] B24D *11/02*

U.S. Cl. 51—295 **5 Claims**



1. Coated abrasive material comprising a dimensionally stabilized woven heat stretched fabric backing member in which the warp and fill yarns are composed of polyester fibers, said coated abrasive material having an elongation profile in the warp direction as defined by a line within the area to the left of the line CD in FIG. **3** of the drawing, a thermoset adhesive layer on the front side of the backing member, and abrasive grains attached to the backing member by the adhesive layer, the fabric cover of the woven backing being from 80 to 97%.

4,035,962

ZIRCON SAND IMPACTING MATERIAL

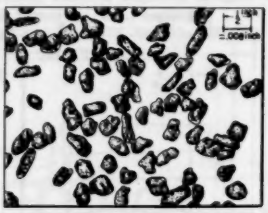
Joseph W. Ayers, c/o The Ayers Company, R.D. No. 2, Bethlehem, Pa. 18017

Division of Ser. No. 413,818, Nov. 8, 1973, Pat. No. 3,939,613. This application Dec. 3, 1975, Ser. No. 637,117

Int. Cl.[2] C09G *1/02*

U.S. Cl. 51—308 **5 Claims**

1. A material for treating hard surfaces by being continually hurled at high velocity against such surfaces, consisting essentially of a selectively sized fraction of the fine grains of a mass of refined zircon sand, said grains having rounded oblong configurations and having a specific gravity of about 4.7 and their sizes being in a range selected from the group consisting



of −100 to +200, −100 to +140, −140 to +200 and −200 to +325 mesh size ranges.

4,035,963

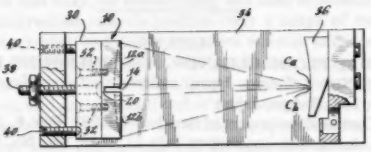
METHOD OF FORMING DUAL MIRRORS

Anthony C. Gilby, Darien, Conn., assignor to Wilks Scientific Corporation, South Norwalk, Conn.

Filed July 2, 1976, Ser. No. 702,214

Int. Cl.[2] B24B *1/00*

U.S. Cl. 51—324 **5 Claims**



1. The method of forming a plurality of identical spherical mirrors having their centers of curvature separated in space which comprises: providing a blank having front and back surfaces; linearly scoring the front surface of said blank to divide said front surface into at least two surface segments; forming said front surface to a spherical shape, each of said surface segments defining a different portion of the surface of a common sphere; and bending said blank substantially solely where scored to separate in space the centers of curvature of each of said surface segments without substantially altering the spherical surface defined by either of said surface segments.

4,035,964

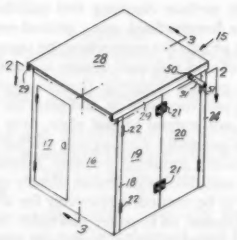
FOLDABLE ENCLOSURE

Kenneth J. Robinson, P.O. Box 86, Atlanta, Mich. 49709

Filed Nov. 14, 1975, Ser. No. 632,011

Int. Cl.[2] E04B *1/344*

U.S. Cl. 52—66 **10 Claims**



1. A foldable enclosure comprising a front wall, a rear wall, respective opposite foldable side walls hinged to the side edges of said front and rear walls, each side wall comprising a plurality of vertically hinged, inwardly swingable sections, a floor

member hinged to the bottom marginal portion of said rear wall and being foldable upwardly to an upright position substantially parallel to and adjacent to said rear wall, a roof member, and means swingably connecting said roof member to the opposite side edges of said rear wall so that said roof member can be at times folded to a position parallel to said rear wall with the floor member, folded side walls and front wall interposed between the roof member and said rear wall, said swingable connecting means including means for holding down said roof member when said enclosure is in its unfolded position and for exerting a clamping force between said rear wall and said roof member when said enclosure is in its folded position, and wherein said swingable connecting means comprises a pair of link bars diagonally connecting the rear portions of the side edges of the roof member to the upper portions of the side edges of the rear wall, so as to provide said holding down and clamping actions.

4,035,965

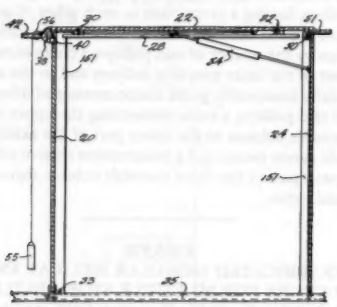
COLLAPSIBLE COMBINATION FENCE AND GARAGE STRUCTURE

Anne A. Ronai, 1150 Fifth Ave., Flat 15E, New York, N.Y. 10028

Continuation of Ser. No. 539,743, Jan. 9, 1975, abandoned. This application Sept. 28, 1976, Ser. No. 727,533

Int. Cl.[2] E04B *7/16*

U.S. Cl. 52—66 **10 Claims**



1. A convertible fence/shed structure comprising:

rail means disposed in an essentially horizontal plane;

a rear wall having top and bottom edges extending transversely of said rail means and defining a vertical plane essentially perpendicular to the rail means; said rear wall being provided with means adjacent its bottom edge and engaging said rail means so that said rear wall can be moved along the length of said rail means while remaining in a plane essentially perpendicular thereto;

a roof having opposed front and rear edges extending transversely of said rail means, said roof being pivotally connected at its rear edge to the upper edge of said rear wall;

a front wall pivotally connected along the front edge of said roof, and side walls operatively connected to said roof, front wall and rear wall so that said side walls, front wall and roof can be pivoted and folded together into a vertically stacked position whereby said side and front walls and roof extend roughly parallel to said rear wall to form with said rear wall a fence which extends transversely of said rail means with the rear wall and roof constituting opposite sides of the fence and which can be positioned at any point along said rail means and said side walls, front wall and roof can be pivoted from said folded position into a position where said side walls and roof extend outwardly from and transversely to said rear wall and to each other and said front wall extends parallel to said rear wall and transversely to said roof and side walls to form an enclosed shed defined by said side walls, front and rear walls and roof.

4,035,966

STRUCTURE HAVING VERTICAL BEARER WALLS AND HORIZONTAL CEILINGS

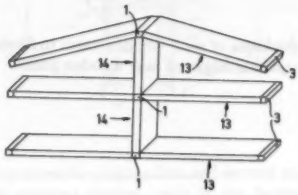
Leon Eugenie Daniel Dompas, 213 Van Rijswijcklaan, Antwerp, Belgium

Continuation of Ser. No. 515,802, Oct. 17, 1974, abandoned. This application Sept. 23, 1976, Ser. No. 725,766

Claims priority, application Germany, Oct. 18, 1973, 2352250

Int. Cl.[2] E04B *1/06, 1/348;* **E04A** *21/14*

U.S. Cl. 52—73 **19 Claims**



1. A structure comprising a plurality of frame parts, each frame part being self-supporting and including interconnected vertical and horizontal strips, a nodal element at the intersection between each vertical and horizontal strip, a terminal element at each end of each vertical and horizontal strip, and at least one block in each vertical and horizontal strip having a length equal to the spacing between said nodal element and one of said terminal elements, said frame parts being arranged in alignment, tension wires for binding said frame parts together so that said aligned vertical strips form a bearing wall of the structure and said aligned horizontal strips form a ceiling of the structure, the lowermost aligned horizontal strips forming the foundation floor of the structure, pull ropes for binding together said vertical and horizontal strips of each frame part, and an anti-corrosive coating covering each rope and wire, the uppermost nodal element of said vertical strip having faces inclined at an acute angle to the vertical, so that said uppermost horizontal strips are correspondingly angled, and each horizontal strip tapering from the vertical strip which it intersects toward its free end, so that at least one of the upper and lower faces of each horizontal strip extends at an acute angle to the horizontal.

4,035,967

RAISED FLOOR PANELS

Ronald William Stanley Harvey, Welwyn, England, assignor to A. R. I. Propaflor Limited, United Kingdom

Filed Dec. 19, 1973, Ser. No. 426,057

Claims priority, application United Kingdom, Dec. 22, 1972, 59463/72; Germany, June 28, 1973, 2333005

Int. Cl.[2] E04F *15/024*

U.S. Cl. 52—126 **4 Claims**

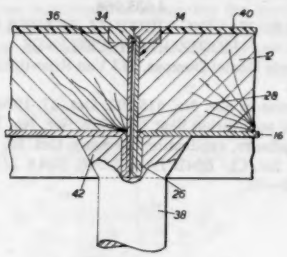
1. A flooring panel for a raised flooring comprising:

a rectangular wooden panel having an upperface, an underface and side edges,

a fire-resisting metal pan adhered to and covering said underface and side edges of said wooden panel,

said metal pan comprising a shaped metal sheet having a flat rectangular shaped section for covering and contacting substantially all of said underface of said wooden panel, four leafs extending from said edges of said rectangular shaped section, each of said leaves comprising a first sub-section adjacent said rectangular shaped section bent downwardly at right angles from said rectangular shaped section and a second sub-section folded back on said first sub-section to form firstly with said first sub-section a

downwardly projecting metal flange and secondly extending upwardly past said first sub-section by substantially



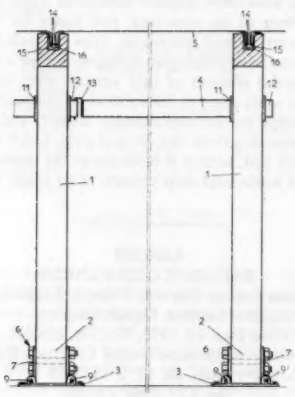
the thickness of such wooden panel to form a metal cover for said side edges of said wooden panel.

4,035,968

DEMOUNTABLE BUILDING

Raymond Caspar, 37, avenue de la Foret Noire, Strasbourg (Bas-Rhin), and Paul-Henri Mathis, 209, rue de la Gare, Muttersholz (Bas-Rhin), both of France

Filed Sept. 8, 1975, Ser. No. 611,335
Int. Cl.² E04B *1/12*
U.S. Cl. 52—63 **2 Claims**



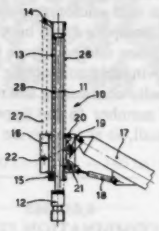
1. Demountable building structure comprising a framework formed of a plurality of arches, crossbars interconnecting the arches, and a cover comprised by a plurality of sheets of flexible weatherproof material, each said sheet having a tension cable along one edge thereof, said tension cable being secured at opposite ends adjacent the bottoms of the arches, the other edge of each sheet being fixed to a said arch and passing beyond said arch in the form of a strip having fixing holes therethrough, the edge of each sheet that has said tension cable also having, turned toward the interior, a flap, and means interconnecting said flap and said strip through said fixing holes, the portion of the sheet with the cable serving only to ensure rain tightness upon the respective arch.

4,035,969

TELESCOPIC COLUMNS OF MACHINES FOR MAKING FOUNDATIONS, AND THE TELESCOPIC COLUMNS THEREBY DERIVED

Bruno Casagrande, Viale Zancanaro, 33077 Sacile, Italy

Filed May 25, 1976, Ser. No. 690,050
Claims priority, application Italy, June 4, 1975, 83388/75
Int. Cl.² E04H *12/34*
U.S. Cl. 52—111 **5 Claims**



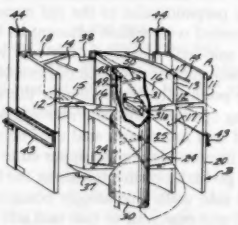
1. In telescopic columns of machines for making foundations consisting of an axially immovable canoe means, a movable outer column guided by said canoe means and a movable inner column within said outer column and guided by said outer column, the improvements including in reciprocal coordination and cooperation a drive means comprising at least two guide pulleys having a proportion to each other of one to two; a chain secured to the two ends of the outer movable column and driven by the smaller of said pulleys; a chain secured to the lower part of the inner movable column and to the upper part of the axially immovable guide canoe means and driven by said larger of said pulleys; a cable connecting the upper part of the inner movable column to the lower part of the axially immovable guide canoe means and a transmission sheave solidly fixed to the lower part of the outer movable column through which passes said cable.

4,035,970

PREFABRICATED MODULAR HELICAL ESCAPE STRUCTURE FOR MULTIPLE STORY BUILDINGS

Willy H. Welcker, South San Francisco, Calif., assignor to Rudi Van Byelvelt, Pinole, Calif.

Filed Mar. 11, 1976, Ser. No. 665,950
Int. Cl.² E04F *11/14*; E04H *14/00*; B65G *11/06*
U.S. Cl. 52—187 **7 Claims**



1. In a building having a multiple story framework generally defining a vertically oriented shaft extending downwardly past a plurality of floors of the building, a prefabricated escape structure comprising:

a plurality of substantially identical superposed sets of modules in said shaft, each of said sets including a pair of substantially identical upper modules of precast material arranged in complemental, confronting relation, and including ramp portions defining upper sections of separate first and second helical slides providing a pair of separated

escape paths; each of said sets further including a pair of substantially identical lower modules of precast material arranged in complemental, confronting relation, and including ramp portions defining lower sections of said first and second slides, said lower modules being arranged below said upper modules with said ramp portions of said lower modules forming downwardly extending continuations of said ramp portions of said upper modules whereby said first and second helical slides formed by said sets of modules are continuous, all of said ramp portions being of cantilever construction, the inner, cantilevered sections of said ramp portions terminating to define a hollow core extending downwardly through said sets of modules;

boundary means attached to and supported by said cantilevered sections of said ramp portions to define a barrier between said first and second helical slides and said hollow core; and

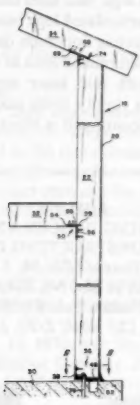
mounting means securing said modules of each of said sets to said framework of said building whereby said framework supports said sets.

4,035,971

BUILDING CONSTRUCTION SYSTEM

Donald A. Hay, 7031 Persimmon Tree Road, Bethesda, Md. 20034

Filed Dec. 18, 1975, Ser. No. 642,117
Int. Cl.² E04G *1/04*
U.S. Cl. 52—236.6 **1 Claim**



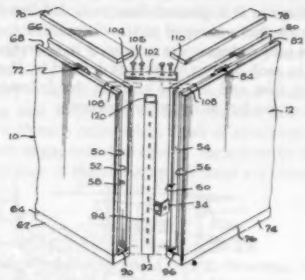
1. In a building construction of the prefabricated type, the improvement which comprises a plurality of vertically arranged exterior wall panels arranged with their sides adjacent each other, each panel having an exterior prefinished side and being formed on the inner side with a plurality of spaced-apart vertical ribs extending throughout the length of the panel, a floor supporting angle member for supporting a plurality of horizontally arranged floor panels from said ribs, each floor panel including a plurality of spaced-apart horizontal ribs on its under side, said angle member comprising a vertical flange secured to said vertical ribs and a horizontal flange secured to said horizontal ribs the ribs of the exterior wall panels and the ribs of the floor panels being provided with recesses to respectively receive the vertical and horizontal flanges of the floor supporting angle member, the depth of the recesses being such as to accommodate the respective flanges to preserve the continuity of the surfaces of said ribs, the horizontal flange of the floor supporting angle member being provided with a lateral extension and the faces of the ribs of the exterior wall panels being provided with slots for receiving said extension.

4,035,972

PANEL JOINING ARRANGEMENTS

Jay Timmons, 921 Via Panarama Ave., Palos Verdes Estates, Calif. 90274

Filed Feb. 23, 1976, Ser. No. 660,366
Int. Cl.² E04G *3/08*; E04B *2/78*
U.S. Cl. 52—241 **8 Claims**



1. An arrangement for joining first and second panel members at facing portions thereof, each of the facing portions having an upper portion adjacent the top of the panel member and a lower portion adjacent the bottom of the panel member, the arrangement comprising an elongated spacing member having an upper portion thereof terminating in a top end and a lower portion thereof terminating in a bottom end having an aperture therein, the spacing member being disposed between and in contact with the facing portions of the first and second panel members along the length thereof, a bottom connecting element mounted on the first panel member adjacent the bottom thereof, the bottom connecting element extending outwardly from the lower portion of the facing portion of the first panel member and curving upwardly and extending into and engaging the aperture in the bottom end of the spacing member to hold the lower portion of the facing portion of the first panel member against the lower portion of the spacing member, an elongated top connecting element having a first portion thereof fastened to the top of the first panel member, the top connecting element extending over the top end of the spacing member and having a second portion thereof opposite the first portion secured in place on the top of the second panel member, the top connecting element holding the upper portions of the facing portions of the first and second panel members against the upper portion of the spacing member, and means holding the lower portion of the facing portion of the second panel member against the lower portion of the spacing member.

4,035,973

BISECTIONAL ARCHITECTURAL STRUCTURE

Franklin S. Sutelan, 301 E. 53rd No. 3A, New York, N.Y. 10022

Continuation of Ser. No. 507,992, Sept. 20, 1974, abandoned.
This application Feb. 2, 1976, Ser. No. 654,538
Int. Cl.² E04B *1/34*
U.S. Cl. 52—263 **27 Claims**

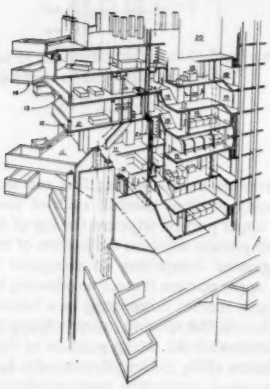
1. An architectural structure comprising a plurality of horizontal floor members, arranged one above the other, and means for supporting said floor members having a plurality of vertical supporting columns, said columns being arranged at a plurality of the points of intersection of the lines of the following grids:

1. a first square grid consisting of a first set of four parallel straight lines spaced apart a given distance **2A** in a horizontal plane and extending in a first direction, and a second set of four parallel straight lines spaced apart said given distance **2A** in said horizontal plane and extending in a second direction perpendicular to said first direction;

2. a second square grid consisting of a third set of two parallel straight lines spaced apart a given distance **2A + 2B** in said horizontal plane and extending in said first direction, and a fourth set of two parallel straight lines spaced apart said given distance **2A + 2B** in said horizontal plane and extending in said second direction;

the lines of said second grid being spaced outward a distance B from the innermost lines of said first grid, and wherein the distance B is greater than zero and less than the distance **2A**, but not equal to the distance A;

wherein said columns are arranged in corresponding positions in each of four quadrants defined by the medial axes of said first and second grids at the following points of intersection but at no other locations;



(a) a plurality of points at which the lines of at least one of said first grid and said second grid intersect with each other; and

(b) a plurality of points at which lines of said first grid intersect with lines of said second grid; and

wherein adjacent columns on the periphery of the columnar arrangement form a plurality of spans along lines which are both parallel and oblique to the lines of said first and said second square grid, a plurality of spans along both said parallel and oblique lines being equal to each other,

whereby said columns of said architectural structure are equidistant in a plurality of non-parallel grid systems.

4,035,974

PRESSURE TANK FOR NUCLEAR REACTORS WITH CONCRETE ENCLOSURE

Hermann Kumpf, Wendelstein, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

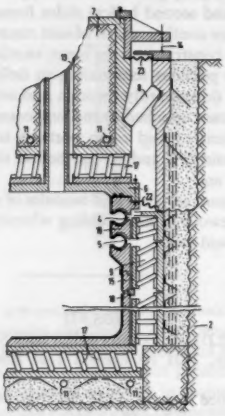
Continuation of Ser. No. 352,265, April 18, 1973. This application Oct. 21, 1974, Ser. No. 516,601

Claims priority, application Germany, Apr. 20, 1972, 2219412

Int. Cl.[2] G21C *13/04;* **E04B** *1/98*

U.S. Cl. 52—249 **8 Claims**

1. Cylindrical pressure tank structure for nuclear reactors comprising a prestressed concrete enclosure, a steel pressure tank for pressurized medium mounted in said concrete enclosure and supporting and insulating means disposed between the outside of said steel tank and the inside of said concrete enclosure, said steel tank in unpressurized condition and at ambient temperature having a radial and axial spacing from said concrete enclosure, said steel tank being expansible at operating condition during which it is pressurized so as to take up at least part of said radial and axial spacing and bear through said supporting and insulating means against said concrete enclosure, said supporting and insulating means comprising an inner support plate adjacent said outside of said steel tank and an outer support plate spaced from said inner support plate and disposed adjacent the inside of said pressurized concrete enclosure and a plurality of spaced articulated legs disposed between said inner and said outer support plates, said steel tank together with said supporting and insulating means being mounted in said concrete enclosure so that said steel tank is at a given maximal spacing from said concrete enclosure maintained by



said spaced articulated legs, said steel tank, said inner support plate and said spaced articulated legs being shiftable together, as said pressurized operating condition during which said steel tank expands, to a predetermined limit at which said expanding steel tank together with said inner support plate and said spaced articulated legs rigidly abuts said outer support plate and said concrete enclosure and is blocked thereby from further expansion.

4,035,975

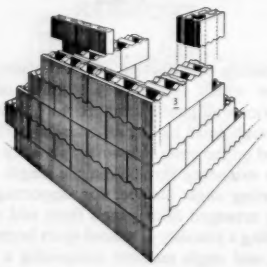
WALL OF BUILDING BLOCKS AND METHOD OF CONSTRUCTING IT

Franz Julius Gergely, Durener Str. 98, 5 Cologne 41, Germany

Continuation-in-part of Ser. No. 504,604, Sept. 9, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,316

Int. Cl.[2] E04C *2/30, 1/10*

U.S. Cl. 52—284 **6 Claims**



1. A wall composed of building blocks arranged end-to-end and one above the other, each building block having the general shape of a right parallelepipedon including including front and rear sides, two ends, a top, and a bottom, said top being formed with continuous undulations each of which extends in a direction from said front side toward said rear side, said bottom being formed with continuous undulations each of which extend in a direction perpendicular to said top undula-

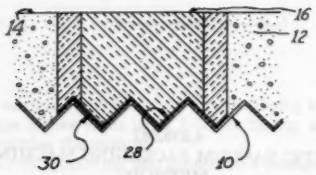
tions, the contour of all said undulations being identical so that the bottom undulations of the block can mesh with the top undulations of another similar block, there being twice as many top undulations as bottom undulations on said block, each end of the block presenting a slot and a rib extending between said top and bottom, said slot and rib on each end being in positions reversed with respect to the slot and rib on the opposite end so that when two such blocks are placed end-to-end, the ribs in the two adjacent ends are accommodated by the slots in those ends, and at least some of said blocks having slots in their sides for accommodating the rib presented by the end of another block when two blocks are arranged perpendicular to each other to form a corner of the wall.

4,035,976

SLEEVING FORM FOR MASONRY MATERIAL

Richard W. Downey, 635 Pine St., Lapeer, Mich. 48446

Filed May 6, 1976, Ser. No. 683,845
Int. Cl.[2] E04G *15/04*; E04C *1/08*
U.S. Cl. 52—577 **8 Claims**



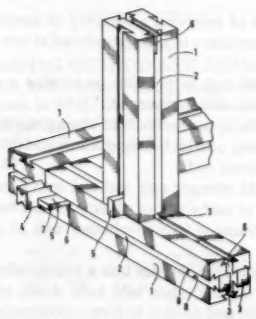
1. A sleeving form for forming a void in masonry material, comprising:
   a. an inner core, and
   b. an outer annular core coextensive with and concentric with the inner core, the inner core having a diameter substantially equal to the inner diameter of the outer core, the inner core being telescopable into and out of the outer core wherein the inner core and the outer core are formed from a friable foamed plastic material.

4,035,977

STRUCTURAL ELEMENT

Artur Fischer, Gde. Waldachtal, Weinhalde 34, D-7241 Tumlingen, Germany

Filed Jan. 22, 1976, Ser. No. 651,398
Claims priority, application Germany, Jan. 25, 1975, 2502989
Int. Cl.[2] E04C *1/10*; A63H *33/08*
U.S. Cl. 52—586 **9 Claims**



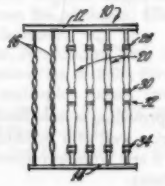
1. A structural element, particularly for the construction of model structures, comprising a body having a periphery and a pair of spaced end portions; connecting means provided for said body for connecting a pair of structural elements with one another, said connecting means including at least one projection having outer surface portions provided at one of said end portions, and at least one groove having inner surface portions formed in said periphery and adapted to receive a projection similar to said one projection for free sliding movement of said respective surface portions relative to each other; and means for urging said respective surface portions towards each other to thereby arrest said structural elements in a selected position relative to each other, said urging means including at least one slot in said body which is open at said periphery and at an end portion of said body and which extends along a portion of said body, and a key which is adapted to be received in said one slot for displacing said respective surface portions into frictional engagement with each other when a pair of structural elements is brought into engagement, whereby variations in the manufacturing tolerance of the structural element are compensated.

4,035,978

TUBULAR SPINDLE COVER

Jay E. Bajorek, Wadsworth, and Albert L. Newman, Cleveland Heights, both of Ohio, assignors to Questor Corporation, Toledo, Ohio

Filed May 17, 1976, Ser. No. 687,319
Int. Cl.[2] E04C *3/30*, *3/34*
U.S. Cl. 52—727 **9 Claims**



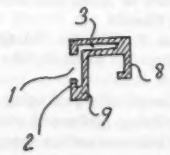
1. A tubular article for enclosing a bar comprising, in combination, a pair of elongated mating hollow sections having edge configurations adapted for mating engagement in assembled relation, interengageable means on said sections for retaining the sections in mating assembled relation, said means including projections and recesses to receive the projections, said projections and recesses being dimensioned whereby the projections are snugly received in the recesses with sufficient friction to hold the sections in assembled mating relation, said sections having lengthwise-spaced portions adapted to be crushed by the bar during assembly of the sections for resisting movement of said sections relative to the bar enclosed by the sections.

4,035,979

PROFILE RAIL

Rudolf Johan Koreska, Adalsparkvej 61, 2970 Horsholm, Denmark

Filed Mar. 10, 1975, Ser. No. 557,141
Claims priority, application Denmark, Mar. 8, 1974, 1266/74
Int. Cl.[2] E04C *3/30*
U.S. Cl. 52—737 **16 Claims**



1. An extruded rail comprising a body having a longitudinally extending flat side surface, an L sectioned channel ex-

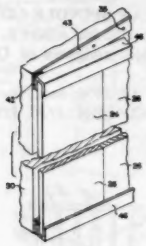
tending longitudinally through the rail and having one limb parallel to said side surface and another limb extending from a junction with an end region of said one limb, at an angle to said side surface and to that side of said one limb remote from said side surface, and a longitudinal slot opening from said side surface to said one limb at a region spaced from said junction of said limbs, said side surface extending to both sides of said slot.

4,035,980

METHOD OF PANEL RE-FACING BUILDING WALLS

Harold P. Lucas, Detroit, Mich., assignor to Harold P. Lucas, Detroit, Mich.

Filed May 23, 1975, Ser. No. 580,528
Int. Cl.[2] E04G 11/00; E04F 13/00
U.S. Cl. 52—745 **1 Claim**



1. The method of providing a new finish inner face on an existing vertical interior wall of a building or room without painting or papering it and without removing or repairing or replastering it comprising:

applying and securing elongated opposed channel members upon and along the upper and lower edges of the wall inner face at the floor and ceiling respectively;

mounting a facing panel of solid free-standing material by snugly nesting its upper and lower edges within said channels firmly holding the panel so as to snugly bear against the wall face throughout its height and throughout the rear surface of the panel;

the channels being so dimensioned in height with respect to the vertical distance between channels that the channels receive the top and bottom edges of the panels in an interlocking coaction;

hinging the channel members at their one ends to the wall on a vertical axis;

swinging said channels outwardly of the wall;

slidably inserting a series of panels edgewise into said channels at their respective tops and bottoms, aligning said panels edge to edge and swinging the channels and panels into snug registry with the wall.

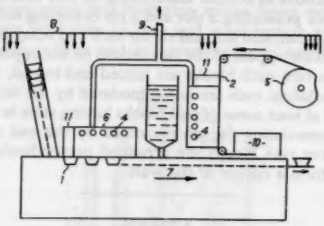
4,035,981

ASEPTIC PACKAGING

Johannes Braun, Roggwil, and Winfried Sturm, Goldach, both of Switzerland, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Dec. 5, 1975, Ser. No. 638,175
Int. Cl.[2] B65B 55/08
U.S. Cl. 53—21 R **12 Claims**

1. In a method of aseptically packaging presterilized products, comprising sterilizing preformed containers of packing material coated on at least one surface thereof with a heat-sealable lacquer, said sterilization including the step of exposing at least said lacquer coated surface to dry-sterilizing radiation in an aseptic workspace, providing said pre-sterilized products in said containers and closing said containers by forming a hermetic seal between two coatings of said lacquer, the improvement which consists in using as the heat-sealable lacquer a



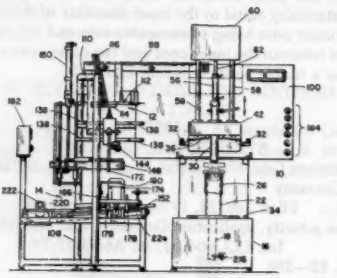
lacquer stabilised against radiation damage occurring as a result of exposure to said dry-sterilizing radiation.

4,035,982

AUTOMATIC VACUUM PACKAGING MACHINE AND METHOD

Eugene H. Paules, Red Lion, Pa., assignor to ExCel Engineering, Inc., Red Lion, Pa.

Filed Oct. 29, 1976, Ser. No. 737,198
Int. Cl.[2] B65B 31/06
U.S. Cl. 53—22 B **31 Claims**



27. A method of receiving a plurality of similar flat objects in stacked manner into a tubular bag closed at one end comprising the steps of:

a. holding said bag in position to receive a series of said objects from a feed conveyor,

b. clamping the upper end of said bag tightly around a tubular evacuating unit including an inner slidable plunger unit and hold down rod,

c. moving said plunger unit and rod into contact with the upper end of said stack of objects in said bag,

d. applying vacuum to said plunger unit to evacuate said bag,

e. withdrawing said plunger unit a limited distance upward from said objects while said hold down rod remains in contact with said objects to form a contracted neck on the upper end of said bag,

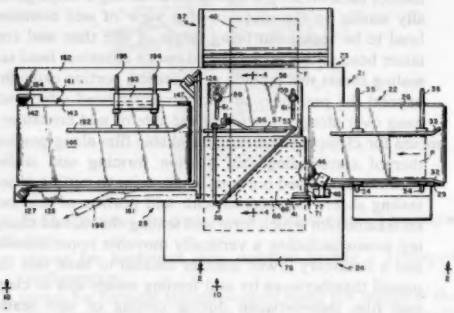
f. withdrawing said hold down rod from said contracted neck while maintaining vacuum in said bag, and

g. transferring said bag to a clip-applying unit for application of a tight clip around said contracted neck of said bag.

4,035,983
SMOOTH PRODUCT TRANSFER HIGHSPEED L-SEALER

F. Garrett Shanklin, Groton; Edward F. Hunt, Littleton, both of Mass., and Francis X. King, Jr., Nashua, N.H., assignors to Shanklin Corporation, Ayer, Mass.

Filed Sept. 29, 1975, Ser. No. 617,306
Int. Cl.[2] B65B 9/06
U.S. Cl. 53—28 8 Claims



1. The method of automatically overwrapping loose assembled groups of like items in an L-sealer having an inverting head comprising the steps of

successively supporting said groups on a substantially horizontal plane to travel in substantially a straight line successively through an infeed area, an overwrap area and a sealing area;

intermittently feeding said groups on said infeed area to be transferred one group at a time to said overwrap area;

supporting on an air film substantially the whole weight of the group in said overwrap area;

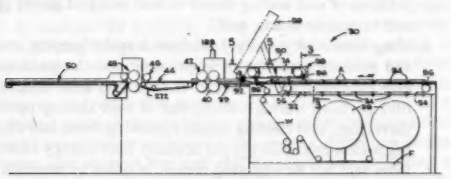
operating a cycle for engaging the trailing edge of the group of said items supported on said air film and driving the so engaged group through said inverting head to said sealing area thereby overwrapping said group;

completing an L-sealing operation on the overwrapped group of articles in said sealing area consisting essentially of the sequence of withdrawing from said sealing area the means used for engaging and driving said group, lowering the level of said sealing area by approximately half the height of said group as assembled, simultaneously forming an L-seal and returning the engaging and driving means to initial position while feeding the next of said groups on said infeed area to said overwrap area, and returning said sealing area to the level of said plane as the sealed overwrapped group is conveyed away from said sealing area.

4,035,984
WRAPPING METHOD AND APPARATUS

Carl J. Gerlach, and Jerome Vande Castle, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Apr. 5, 1976, Ser. No. 673,499
Int. Cl.[2] B65B 9/06
U.S. Cl. 53—28 18 Claims

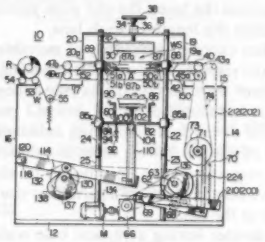


1. A method of packaging articles comprising the steps of moving a web of packaging material having a longitudinal intermediate portion and edge portions along a path, moving a pair of spaced articles along spaced parallel paths onto the web for movement therewith, folding the web around the articles with the longitudinal edge portions disposed between the articles, longitudinally sealing the edge portions to the intermediate portion for encompassing each article in a tube of packaging material, transversely sealing the tubes to confine the articles therein, a plurality of pairs of longitudinally and transversely spaced articles are moved onto the web to define two continuously moving rows of spaced articles, transversely severing article filled and sealed packages from the tubes, the material is longitudinally severed prior to being transversely sealed and severed, and additionally applying tube holding and separating pressure, on the sealed and severed edge and intermediate portions of a web for maintaining the entubed articles in their spaced parallel paths.

4,035,985
METHOD AND APPARATUS FOR WRAPPING GOODS IN A STRETCHABLE FILM MATERIAL

Kozo Aoyama, Tokyo; Hiroshi Iijima, Kawasaki, and Shizuo Kikuchi, Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 536,293, Dec. 24, 1974, abandoned.
This application Oct. 6, 1975, Ser. No. 620,195
Claims priority, application Japan, Dec. 29, 1973, 49-4150; June 21, 1974, 49-70149; June 22, 1974, 49-70818; July 2, 1974, 49-75055; July 15, 1974, 49-80214
Int. Cl.[2] B65B 43/30
U.S. Cl. 53—30 R 45 Claims



1. A method of wrapping an assembly of articles on a tray in an elastic and stretchable plastics film material, comprising the steps of

feeding a sheet of the plastics film material to a predetermined position above the assembly of articles on a tray to be wrapped and beneath a resiliently deformable bearing means,

subjecting said sheet to a differential pressure to form an upwardly stretched bubble in the central zone of said sheet while portions of said sheet adjacent at least two opposite edges thereof are held fast until the top of the bubble is engaged by said bearing means,

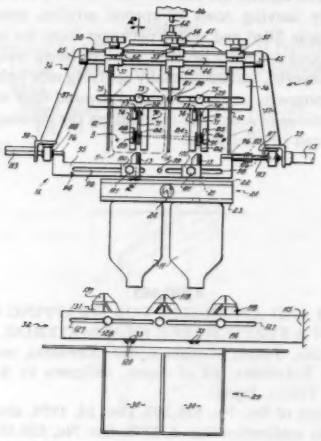
causing relative movement of the assembly of articles on a tray with respect to the bubbled sheet to introduce the assembly of articles on a tray into the bubble and to upwardly depress said bearing means, and positively maintaining the engagement between the top of the bubble and the upwardly depressed portion of the bearing means while tucking the edges of said sheet against the side of the assembly of articles on a tray remote from the bubble to secure said edges together.

4,035,986

UNIVERSAL HEAD AND INTERMEDIATE GRID FOR CASE PACKERS

William E. Clem, and John F. Nolan, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Dec. 31, 1975, Ser. No. 645,622
Int. Cl.[2] B65B *57/10, 5/08*
U.S. Cl. 53—61 **10 Claims**



1. A head for an automatic case packer, comprising,

a head frame and means for mounting it to the packer,

a series of lane dividers mounted from the frame, the dividers providing a plurality of parallel lanes between them for receiving articles in single file relation,

an end plate mounted from the frame and extending transversely across the lanes, the end plate presenting a barrier which limits the length of each lane,

said end plate carrying a plurality of movable flags projecting into the respective lanes, each flag being positioned for engagement by an article in its lane when the article is proximate to the end plate,

at least some of the said flags being mounted from the end plate by means for shifting them in a direction transverse to their respective lanes, in order to be aligned with the respective central planes of a particular size of article to be received in the lanes,

each lane divider having a vertical base wall with legs upstanding from the base wall, the divider being suspended from the frame by the legs,

said end plate extending transversely across the lanes above the base walls of the respective lane dividers,

said end plate having lane stops mounted to it which project downwardly into the respective lanes between the base walls of the lane dividers.

4,035,987

APPARATUS FOR SEALING THE HEADS OF CONTAINERS

Tetsuo Nakazato, Sakai; Shunji Kamon, Kawanishi; Koichi Tokuda, Takarazuka, and Keisuke Honma, Itami, all of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Jan. 23, 1976, Ser. No. 651,816
Claims priority, application Japan, Jan. 30, 1975, 50-13237
Int. Cl.[2] B65B *61/18, 7/28;* **B67B** *3/04*
U.S. Cl. 53—133 **6 Claims**

1. Apparatus for sealing the heads of containers with heat shrinkable film comprising:

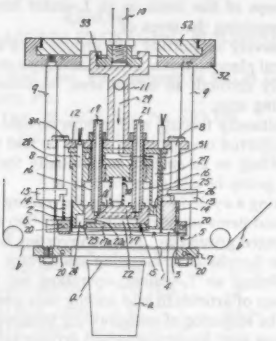
means defining a sealing location;

means for positioning containers to be sealed at their sealing location:

means for intermittently feeding a continuous film of heat shrinkable material past said sealing location above a container located thereat;

cutter means disposed at said sealing location above a container positioned thereat and including a vertically movable angular punch, said punch being sized and configured to cut from said heat shrinkable film individual portions thereof each forming a sealing sheet having a shape generally similar to the shape in plan view of said container head to be sealed but being larger in size than said container head so that when placed over a container head said sealing sheets will include an overhang portion extending beyond the periphery of said container head which will hang over along a portion of the side of said container;

means for clamping said heat shrinkable film along portions thereof surrounding said portion forming said sealing sheet, said clamped portions being, prior to cutting of said sealing sheets, contiguous with said portion of said heat shrinkable film which form said sealing sheets, said clamping means including a vertically movable upper member and a stationary lower member located to have said film passed therebetween by said feeding means and to clamp said film therebetween during cutting of said sealing sheets, said upper and lower members of said clamping



means being arranged to extend about said vertically movable annular punch in close proximity thereto thereby to act as a die member for said punch when said punch is actuated to cut said sealing sheets from said film;

holding means positioned over the head of said containers placed at said sealing location and movable downwardly into engagement with said container heads to press said sealing sheets against said head after said sealing sheets have been cut from said film;

means operatively associated with said holding means to fold said sealing sheets along the periphery of said container head to urge said overhand portions of said sealing sheets to extend downwardly along a portion of the sides of said containers;

means for applying hot air against said molded overhang portions of said sealing sheets to heat seal said sheets upon said container heads; and

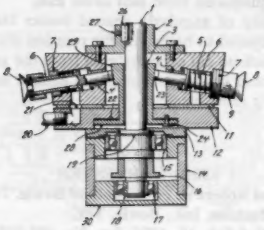
cooling means physically joined with said clamping means and extending therewith in proximity to the portions of said clamping means which engage said heat shrinkable film portions during cutting-out of said sealing portions therefrom, said cooling means removing from said clamping means heat energy, particularly heat energy received from said hot air applying means, in order to maintain the temperature of said clamping means at a level sufficiently low to avoid deleterious shrinkage of said portions of said film clamped in said clamping means.

4,035,988

VACUUM POCKET-OPENING TURRET

David Daniels, Jacksonville, Fla., assignor to General Foods Corporation, White Plains, N.Y.

Filed June 4, 1976, Ser. No. 693,024
Int. Cl.[2] B65B *1/02, 43/30*
U.S. Cl. 53—183 3 Claims



1. In an apparatus for continuously forming sealed packages including:

a. means for feeding a strip material having a U-shaped configuration,

b. means for forming spaced pockets along the length of the strip material leaving the top edges of the pocket sidewalls unsealed,

c. a filling station having a rotating turret and an overhead rotating filling drum equipped with a plurality of discharge tubes, said turret provided with a plurality of circumferentially-spaced collapsible suction heads about its periphery said heads being for engagement with a first outer sidewall of said pockets, and

d. means for sequentially collapsing said suction heads and withdrawing the pocket sidewall with which the collapsed head is engaged,

the improvement comprising, a rotating pocket-opening turret provided around its periphery with a plurality of circumferentially-spaced, spring-biased, reciprocating vacuum nozzles rotating about a stationary cam which cam has a cam face which is inclined from the vertical and which cam sequentially thrusts the vacuum nozzles out into engagement with the second outer sidewall of said pocket while said vacuum nozzle is in communication with a vacuum source and while said first sidewall is engaged with said collapsible suction head and which cam permits abrupt withdrawal of the vacuum nozzle while it is still engaged with said second sidewall in order to effect separation of the top edges of the pocket sidewalls prior to filling the pocket with a granular material and thereafter, placing the vacuum nozzle in communication with a passageway leading to the atmosphere in order to release said sidewall from the vacuum nozzle.

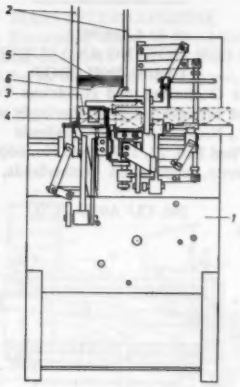
4,035,989

MACHINE FOR ERECTING, FILLING AND CLOSING FLAT-FOLDABLE CARTONS

Wilhelm Schuster, Lilienstr. 11, Ettlingen-Bruchhausen, Germany (7505)

Filed Jan. 7, 1976, Ser. No. 647,092
Claims priority, application Germany, Jan. 7, 1975, 2500392
Int. Cl.[2] B65B *5/02, 43/28, 43/32*
U.S. Cl. 53—186 13 Claims

1. A machine for erecting, filling and closing a rectangular carton having hinged top, bottom and side walls which is flat-foldable for stacking before erection and which has foldable end flaps at each end for closing it, comprising a magazine having spaced walls for stacking a plurality of cartons in a flat-folded position therebetween, a support bar defining a first station located below said discharge opening, deflection means between said support bar and said magazine for deflecting a side wall of the carton upwardly so as to erect the side walls and top above the bottom and to permit the bottom to fall on said support bar, an engagement member movable to engage each carton in succession and to move it past said deflection means and deposit it on said support bar, a shifting member movable backwardly and forwardly over said support bar and being movable against a side wall of said carton to deflect it to a fully upright erected position and to hold it in an erected condition on said support bar, means adjacent said first station for filling the erected carton with a product, a movable receiving bar being positionable alongside said support bar in a position to receive the filled carton therefrom, a top enngagement bar engageable with the top of the filled carton when it is positioned on said receiving bar, said receiving bar and said top engagement bar being movable together with said carton to a second station spaced from said first station, pusher means for engaging the filled carton and moving it out of said first station onto said receiving bar and between said receiving bar and said top engagement bar and closing means at said second station for folding said foldable end flaps.

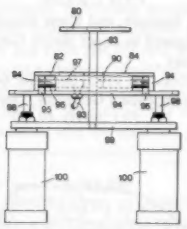


4,035,990

WRAPPING MACHINE

Harry Hallam, Coventry, England, assignor to A Campton & Sons Company Limited, Coventry, England

Filed Dec. 31, 1975, Ser. No. 645,899
Claims priority, application United Kingdom, Jan. 8, 1975, 712/75
Int. Cl.[2] B65B *11/06*
U.S. Cl. 53—222 3 Claims



1. A wrapping machine for wrapping articles in stretchable sheet material, comprising article feed means for feeding articles to a wrapping station, the article feed means including a lifting platform on which the articles are lifted into the stretchable sheet material, feed means for feeding predetermined lengths of the stretchable sheet material to the wrapping station, holding means for holding the edges of the lengths of material at the wrapping station during the wrapping operation, a wrapping mechanism for wrapping the edges of the

lengths of material under the articles at the wrapping station, and reciprocable gripping means for gripping the articles during the wrapping operation and for discharging the wrapped articles from the wrapping station, the lifting platform comprising a three part plate having a central part and lateral parts extending from opposite sides of the central part, the lateral parts being movable towards and away from one another and vertically relative to the central part during a wrapping operation.

4,035,991

DEVICE FOR MOWING AND SUBSEQUENTLY CRUSHING CROP

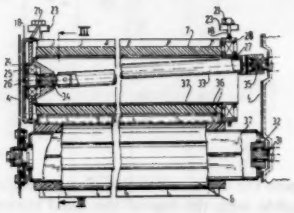
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Feb. 23, 1976, Ser. No. 660,043

Claims priority, application Netherlands, Feb. 28, 1975, 7502442

Int. Cl.² A01D *73/00*

U.S. Cl. 56—1 **23 Claims**



1. A crop harvesting and conditioning device which comprises cutting means for cutting a crop and crusher means operatively associated with said cutting means for receiving the cut crop and conditioning it prior to discharge from the device, the crusher means comprising a pair of rollers at least one of which is movable with respect to the other to vary the nip therebetween, and drive means for driving said one roller, the improvement wherein:

said one roller is hollow and said drive means includes a driving shaft projecting into one end of said one roller, with clearance, and having an inner end which is drivingly connected to said one roller in spaced relation to said one end thereof.

4,035,992

HAY HARVESTING MACHINE FOR BREAKING UP THE CUT GRASS

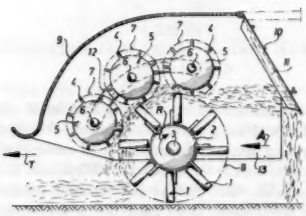
Karl Moosbrucker, Saulgau, and Hans Rauch, Kleintissen, both of Germany, assignors to Josef Bautz GmbH, Saulgau, Wurthemberg, Germany

Filed Dec. 15, 1975, Ser. No. 641,020

Claims priority, application Germany, Dec. 13, 1974, 2459007

Int. Cl.² A01D *49/00*

U.S. Cl. 56—1 **10 Claims**



1. A hay harvestng machine comprising:

a support displaceable along the ground in a predetermined direction;

a drum rotatable on said support about a horizontal drum axis transverse to said direction;

a plurality of angulariy spaced elastic conveying members on said drum;

a plurality of rollers freely rotatable on said support about respective roller axes generally parallel to and generally radially equispaced from said drum axis;

and a plurality of angularly spaced beater blades on said drum is adpated to be driven for rotation about its axis in order to pick up cut crop material from the ground below the drum and throw such material against said rollers to rotationally entrain same.

4,035,993

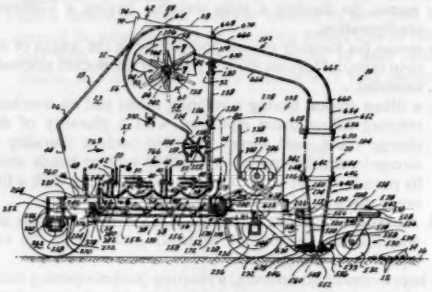
SEED HARVESTER

Rex D. Bell, and Robert R. Favor, both of Bowie, Tex., assignors to Bowie Industries, Inc., Bowie, Tex.

Filed Feb. 18, 1976, Ser. No. 659,008

Int. Cl.² A01D *45/30*

U.S. Cl. 56—13.1 **9 Claims**



8. Apparatus for separating seeds from pine cones, pine needles and the like comprising:

a separator having an open bottom;

a screen mounted in said open bottom of said separator for receiving said seeds, pine cones, pine needles and the like;

means for vibrating said screen so that said seeds will pass through said screen, said screen being a fine mesh screen having a plurality of troughs, said screen-vibrating means including a plurality of flexible fingers rotatably mounted along the long axis of each trough for cyclically striking said screen; and

a plurality of rigid fingers positioned adjacent said flexible fingers for sweeping said separated debris out of said troughs.

4,035,994

LAWN MOWER BLADE CONTROL APPARATUS

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed May 27, 1975, Ser. No. 581,029

Int. Cl.² A01D *75/20*

U.S. Cl. 56—11.3 **8 Claims**

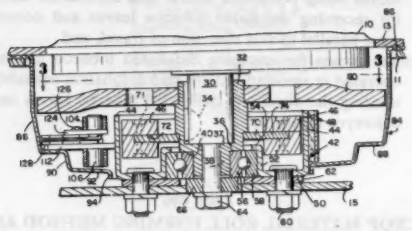
8. In a lawn mower comprising a blade drive shaft depending below a mower deck, a blade carrier rotatably mounted on such shaft and including a drum rotatable with said carrier and adapted to be engaged by an encircling brake band, the improvement comprising

a bowl for enclosing said drum, having a top mounting flange for mounting the bowl on the mower deck, a generally circular said wall depending from said flange, a generally flat annular platform joined to said side wall at the bottom thereof and extending inward therefrom toward said drum, and a lower wall portion extending downward and inward from the inner edge of said platform into close

clearance relation with a lower portion of said blade carrier,

a mounting plate mounted on said platform and extending arcuately about the drum,

a brake band anchored at one end to said plate and extending therefrom about the drum substantially in excess of 180° so as to present its free end toward said mounting plate,



a spring or the like connecting said free end to a spring anchor on said plate and acting to bias the brake band into braking engagement with the drum,

a reaction bracket mounted on said platform, and manually operable tension means connected between the free end of the brake band and such reaction bracket and operable to retract the free end of the brake band against the spring bias to release the brake.

4,035,995

DEVICE FOR CONNECTING A CUTTER UNIT TO A FRAME OF A POWERED LAWNMOWER

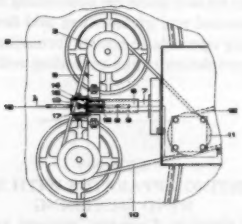
Lennart Oswald Arnblock, Vellinge, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland

Continuation of Ser. No. 542,611, Jan. 20, 1975, abandoned. This application June 18, 1976, Ser. No. 697,467

Claims priority, application United Kingdom, Jan. 19, 1974, 2637/74

Int. Cl.[2] A01D *35/22*

U.S. Cl. 56—11.6 **2 Claims**



1. A quick release device for removably attaching a belt driven cutter unit to an engine driven pulley mounted on a movable frame, comprising in combination, the cutter unit having at least one drive pulley for engaging the belt, a telescopically adjustable two-part rod-cylinder array having one part rigidly secured to said frame and the second part rigidly secured to said cutter unit and relatively movable between a disengaged position with said cutter unit and frame unit separated and an engaged position with the telescopic parts mated, a belt about said pulley retaining said rod and cylinder in teleseoping arrangement and limiting relative axial movement of the two parts in the direction of increase of length of the telescopic parts, and locking means comprising two manually operable locking members respectively on said rod parts movable into engagement with each other for locking the parts in telescopic registration preventing axial movement of said rod parts in the direction loosening the belt about said pulleys said locking means being provided with an adjustable spacer for engaging said rod and an eccentrically mounted latch member presenting a surface engaging said spacer to restrict movement of said rod in locked position toward loosening said belt and permitting telescoping in unlocked position in the direction loosening said belt to thereby permit removal of said belt from said pulley and telescopic disengagement of said cutter from said frame.

4,035,996

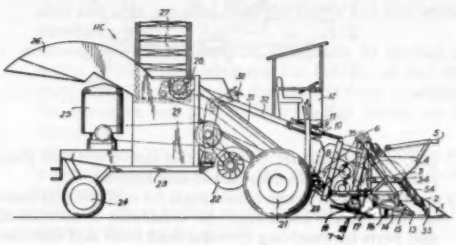
HARVESTER COMBINE

Carlos M. Cruz Fernandez, 7605, 55 St., Marianao; Rogelio Rodriguez Valdes, 21415, 67 Ave., La Lisa, Marianao, and Delfin Perez Alberto, 68, Perkins St., Luyano, Havana, all of Cuba

Filed May 15, 1975, Ser. No. 577,744

Int. Cl.[2] A01D *45/10*

U.S. Cl. 56—13.9 **9 Claims**



1. A harvester combine, comprising a self-propelled vehicle having a chassis and an operator's cab mounted thereon, a frame carried by said chassis for suspension at least partially in front thereof, a nose frame carried pivotally by said frame, a pair of worm conveyors supported adjacent their upper ends by said nose frame and extending forwardly and downwardly therefrom one of said worm conveyors being positioned inwardly of one side of said chassis and the other of said worm conveyors being positioned inwardly of the other side of said chassis, a pair of lower cutter means carried by said nose frame movably relative to the ground, a skid member carried pivotally by said nose frame and supporting the lower end of each of said worm conveyors, said skid members being spring biased at the rear thereof to urge the respective forward portions of the skid members upwardly away from engagement with the ground, second cutter means carried by said nose frame above said lower cutter means and including a pair of oppositely rotatable drums each of which is provided with a knife means thereon, a longitudinally extending second conveyor means carried by said nose frame and adapted to receive the harvested crop which has been cut by said second cutter means and to convey same to a cleaning chamber, a cleaning chamber mounted on said chassis, said cleaning chamber having means associated therewith for separating the harvested cut crop from extraneous material and for separately discharging same.

4,035,997

DEVICE FOR AUTOMATIC ADJUSTMENT OF THE POSITION OF THE CUTTING PLATFORM OF A GRAIN HARVESTING MACHINE

Mihail Duca; Dan Vasiliu; Teodor Demetrescu; Ion Cimpoias; Ion Linca; Stefan Breazu; Virgil Antonescu, and Iosif Cojocaru, all of Bucharest, Romania, assignors to Institutul de Cercetari si Proiectari de Masini Agricole - ICPMA, Bucharest, Romania

Filed Sept. 8, 1975, Ser. No. 611,255

Int. Cl.[2] A01D *75/28*

U.S. Cl. 56—209 **2 Claims**

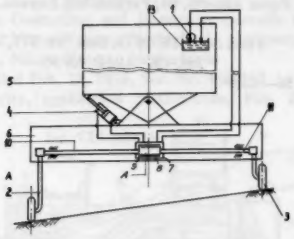
1. A device for automatically maintaining a cutting platform of a grain harvesting machine parallel to the ground, said

machine comprising a body and means mounting said platform tiltably on said body, said device comprising:

a pair of ground-engaging feelers movably mounted on opposite ends of said platform;

a differential distributor comprising a distributor housing formed with a plurality of ports, a sleeve rotatably received in said housing and provided with a pair of bores, and a plug rotatably received in said sleeve and formed with a passage;

a respective rod connecting one of said feelers with said sleeve and a respective rod connecting the other of said feelers with said plug whereby rotation of said rods and



said feelers angularly displaces said sleeve and said plug relatively to one another and to said housing;

a pump connected to one of said ports for supplying hydraulic fluid thereto and a reservoir connected to another of said ports for receiving hyraulic fluid from said distributor; and

a double-action piston-and cylinder arrangement connected by said platform and said body for tilting said platform and said body for tilting said platform in response to relative angular displacement of said sleeve and said body, said double acting piston-and cylinder arrangement being connected to further ports of said housing.

4,035,998

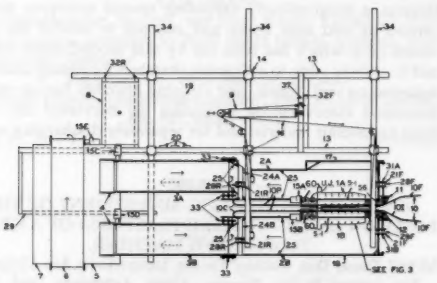
TRACTOR MOUNTED TOBACCO COMBINE FOR DEFOLIATION AND SUBSEQUENT TRANSPORTATION OF TOBACCO LEAVES

Henry Griner; Wade Griner; Tommy Sweat, and Claude Hyars, all of Patterson, Ga., assignors to G S & H Equipment Corporation, Patterson, Ga.

Filed Sept. 6, 1974, Ser. No. 503,676

Int. Cl.[2] A01D *45/16*

U.S. Cl. 56—27.5 **8 Claims**



1. A tobacco harvesting implement comprising

a first frame assembly means for mounting same at a fixed level on a tractor,

a second frame assembly mounted for vertical movement on said first frame assembly,

a defoliation assembly mounted on said second frame assembly, said defoliation assembly being elongated in the direction of travel and including a pair of counter rotating tobacco leaf defoliators, upper and lower stalk guide means for guiding tobacco leaf-bearing stalks between said pair of counter rotating tobacco leaf defoliators, the upper stalk guide being above said counter rotating tobacco leaf defoliators and the lower stalk guide being below said counter rotating tobacco leaf defoliators,

conveyor means on said frame assemblies, said conveyor means being positioned below said defoliation assembly for receiving defoliated tobacco leaves and conveying same parallel to said direction of travel, and

kicker means for engaging defoliated tobacco leaves and operated in association with said defoliation assembly for insuring the deposit of defoliated tobacco leaves on said conveyor means.

4,035,999

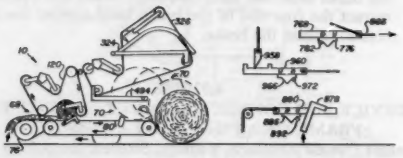
CROP MATERIAL ROLL FORMING METHOD AND MACHINE

Jack W. Crane, Rte. 2, New Holland, Pa. 17557, and Aquila D. Mast, 1316 Clayton Road, Lancaster, Pa. 17603

Filed Feb. 9, 1976, Ser. No. 656,758

Int. Cl.[2] A01D *43/02*

U.S. Cl. 56—341 **34 Claims**



16. A crop material roll forming machine, comprising:

a mobile frame adapted to move across a field;

means on said frame for delivering crop material to said machine;

first means on said frame for initiating formation of a roll of crop material to a first size; and

second means on said frame for completing formation of said roll to a second size greater than said first size, said first means being operable to initiate formation of another roll prior to completion of the preceding roll by said second means.

4,036,000

YARN TWISTING APPARATUS WITH SOUND AND WIND SHIELDING

Aloys Greive, Munster, Germany, assignor to Hamel GmbH Zwirnmaschinen, Munster, Germany

Filed Sept. 17, 1976, Ser. No. 724,462

Claims priority, application Germany, Sept. 18, 1975, 7529598[U]

Int. Cl.[2] D01H *1/00*; G10K *11/04*

U.S. Cl. 57—1 R **18 Claims**

1. A twisting apparatus comprising:

a frame;

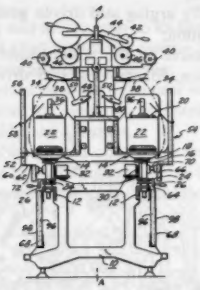
a row of yarn twisters extending along said frame and each having a balloon-limiting cup;

a front wall panel secured to said frame extending along said twisters and having an upper edge generally level with the tops of said cups and a lower edge generally level with the bottoms of said cups;

an upper wall flap displaceable between an operational position extending upwardly from said upper edge and a service position giving access past said upper edge to said twisters; and

a lower wall flap displaceable between an operational posi-

tion extending downwardly from said lower edge and a service position giving access past said lower edge to said



twisters, said flaps and said front wall panel being at least partially made of sound-deadening material.

4,036,001

METHOD AND APPARATUS FOR DOFFING AND DONNING BOBBINS IN SPINNING MACHINE

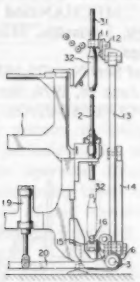
Hideo Tamai, Kariya; Takayuki Morita, Ohbu; Masanao Kobayakawa, Anjyo, and Ikuo Komura, Toyota, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 25, 1976, Ser. No. 670,376

Claims priority, application Japan, Mar. 31, 1975, 50-37881; Mar. 31, 1975, 50-42094

Int. Cl.[2] D01H *9/04, 9/18*

U.S. Cl. 57—52 **8 Claims**



1. An apparatus for removing full bobbins from a succession of spindles of a spinning machine and applying empty bobbins to the spindles from which the full bobbins have been removed, the apparatus comprising bobbin conveying means extending along the side of the spinning machine and having a succession of bobbin supporting portions thereon corresponding in pitch to the spindles; a succession of bobbin holders arranged along the side of the spinning machine and corresponding in pitch to the spindles, each holder including means for defining a space for receiving the bobbin, and means movable relative to the space for restricting the size of the space to allow the holding of the bobbin, the restricting means of the holder including upper and lower contact surfaces movable relative to the space between an inoperative position, in which the space has a size larger than the diameter of the empty bobbin, and an operative position in which the space is restricted to a size sufficient to hold both the empty and full bobbins simultaneously owing to contacts of the upper and lower contact surfaces with the empty and full bobbins; and means for moving the holders to transfer the bobbins between the spindles and the conveying means.

7. A bobbin doffing and donning method in a spinning machine including a succession of spindles, a conveyor for conveying the empty and full bobbins along the side of the spinning machine, and a succession of bobbin holders for holding and transferring the bobbins between the spindles and the conveyor, comprising the steps of:

removing each empty bobbin from the conveyor by grasping the upper end of an empty bobbin by a holder and moving the holder upwardly with the empty bobbin held at the upper end thereof;

moving the upwardly moved holder to position the empty bobbin above a corresponding full bobbin mounted on a spindle with the empty bobbin in axial alignment with the full bobbin;

releasing the empty bobbin from the holder to allow the lower end of the empty bobbin to abut against the upper end of the full bobbin;

moving the holder down along the empty bobbin until it reaches the junction where the empty and full bobbins abut and then grasping both the empty and full bobbins simultaneously;

removing the full bobbin from the spindle by moving the holder holding the empty and full bobbins up and then away from the spindle and then downwardly to adjacent the conveyor and placing only the full bobbin on the conveyor;

moving the holder upwardly along the empty bobbin and grasping the upper end of the empty bobbin with the holder; and

moving the empty bobbin above the spindle and placing the empty bobbin on the spindle.

4,036,002

DIRT REMOVAL IN SPINNING DEVICE

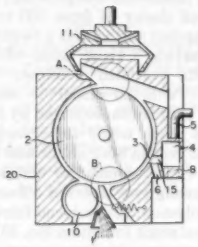
Akira Kobayashi, Ohbu, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 518,945, Oct. 29, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,850

Claims priority, application Japan, Nov. 1, 1973, 48-127433

Int. Cl.[2] D01H *7/02*

U.S. Cl. 57—58.89 **3 Claims**



1. A fiber spinning device comprising:

a rotary spinning chamber;

a housing;

means cooperating with said housing for combing a sliver into individual fibers and feeding said fibers along a path to said rotary spinning chamber;

means communicating with said path for continuously removing dirt from said fibers during the operation of said combing means, said dirt removing means comprising:

a dirt discharge opening in said housing communicating with said path;

a dirt collection chamber positioned to receive therein dirt passing through said discharge opening;

an air inlet and an air outlet opening into said dirt collection chamber;

means connected to one of said air inlet and said air outlet

for continuously creating an air current through said dirt collection chamber to continuously remove dirt therefrom during the operation of said combing and feeding means; and

throttling means for throttling and maintaining the speed of a portion of said air current tending to move from said dirt collection chamber to said dirt discharge opening below a value which would prevent dirt from moving from said dirt discharge opening to said dirt collection chamber, said throttling means comprising a longitudinal duct connecting said dirt discharge opening and said dirt collection chamber, said longitudinal duct having a transverse cross-sectional area substantially smaller than that of said dirt collection chamber, said cross-sectional area being substantially uniform throughout the entire length thereof; and

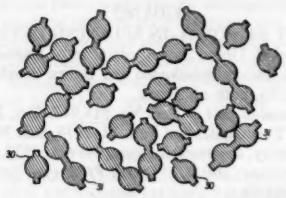
air supply duct means opening into said longitudinal duct adjacent said dirt discharge opening for supplying air to said path to prevent fibers from passing from said path through said dirt discharge opening.

4,036,003

POLY(ETHYLENE TEREPHTHALATE) FIBRILLATED TAPE SEWING THREAD

F. Ray Lowder, Gastonia, and John D. Gibbon, Charlotte, both of N.C., assignors to Celanese Corporation, New York, N.Y. and Fiber Industries, Inc., Charlotte, N.C.

Filed Nov. 20, 1975, Ser. No. 633,757
Int. Cl.[2] D02G *3/06, 3/46*
U.S. Cl. 57—140 R **5 Claims**



1. An improved fusion-resistant poly(ethylene terephthalate) yarn having a total denier of from 100 to 350 wherein the improvement comprises said yarn is a twisted single ply fibrillated tape yarn having a twist factor of from 130 to 160, wherein twist factor is defined as follows:

Twist factor = $\sqrt{\text{thread denier}} \times$ twists per inch, and wherein said yarn is characterized by less than one break per 20 yards when tested for sewing performance by threading said yarn in both needle and bobbin positions in a Singer 281-1 sewing machine with a size 14 ball point needle and sewing two layers of a four ounce per square yarn 65/35 polyester/cotton blend fabric for twenty yards using a Federal stitch formation No. 301 lockstitch at 4500 stitches per minute with four ounces of tension on said yarn.

4,036,004

CLOCK WITH STRIKING MECHANISM

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,143
Int. Cl.[2] G04B *21/06*
U.S. Cl. 58—9 **20 Claims**

1. In a clock having an hour hand shaft and a minute hand shaft:

striking means operable to cause a sound;

control means actuable to limit to a predetermined number the strikes made by said striking means;

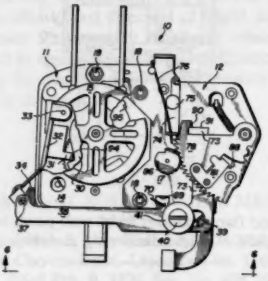
a constantly rotating gear;

a driven gear;

means mounting said driven gear for movement between a first position, in which said driven gear is in engagement with said constantly rotating gear, and a disengaged second position;

means normally urging said driven gear to said disengaged second position;

means, responsive to the minute hand shaft attaining the hour position, for moving said driven gear to its first position;



drivable means, driven by said driven gear when the latter is in its first position, for operating said striking means and for actuating said control means;

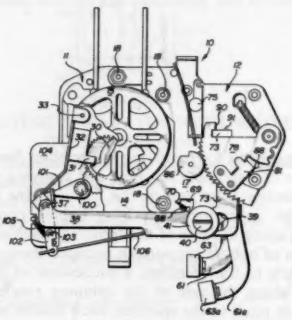
and means, operable by said control means, for returning said driven gear to its disengaged second position when said striking means has struck said predetermined number of strikes.

4,036,005

CLOCK WITH HOUR AND QUARTER HOUR STRIKING MECHANISM

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 671,143, March 29, 1976. This application June 18, 1976, Ser. No. 697,440
Int. Cl.[2] G04B *21/00, 19/02*
U.S. Cl. 58—9 **15 Claims**



1. In a clock having an hour hand shaft and a minute hand shaft:

striking means operable to cause a sound;

control means actuable to limit the strikes made by said striking means to a predetermined number of strikes determined by the positions of said hour hand and minute hand shafts;

a constantly rotating gear;

a driven gear;

means mounting said driven gear for movement between a first position, in which said driven gear is in engagement

with said constantly rotating gear, and a disengaged second position;

means normally urging said driven gear to said disengaged second position;

means for moving said driven gear to its first position when the minute hand shaft attains the quarter hour, half hour, three quarter hour and hour positions;

drivable means, driven by said driven gear when the latter is in its first position, for operating said striking means and for actuating said control means;

and means, operable by said control means, for returning said driven gear to its disengaged second position when said striking means has struck said predetermined number of strikes.

4,036,006

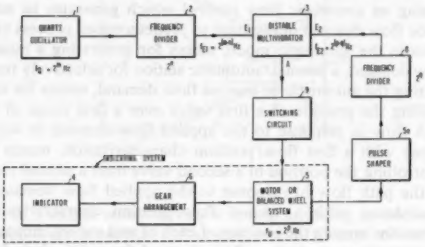
TIME-KEEPING APPARATUS

Hubert Effenberger, Neckargroningen, and Walter Seeger, Pforzheim, both of Germany, assignors to Gunther Glaser, Stuttgart and Hubert Effenberger, Neckargroningen, both of, Germany

Continuation of Ser. No. 439,904, Feb. 6, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 621,083

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **11 Claims**



1. A time-keeping apparatus comprising, in combination:

a. a time-indicating system, including electromechanical means, capable of periodic motion selectively at one of at least two non-zero operating frequencies, one of said operating frequencies being lower than said nominal frequency and another of said operating frequencies being higher than said nominal frequency;

b. pulse means, coupled to said time-indicating system for generating monitor pulses proportional in frequency to said operating frequencies of said indicating system;

c. quartz oscillator means for generating electrical pulses of a given frequency;

d. frequency divider means connected to said quartz oscillator means for generating a pulse train of nominal frequency;

e. logical control means having at least two inputs, one of said inputs being connected to receive said pulse train of nominal frequency and the other of said inputs being connected to receive said monitor pulses, and having an output the state of which depends on the states of said at least two inputs;

f. switching means, controlled by said output from said logical control means and connected to said time-indicating system, for selective electrical connection of portions of said electromechanical means to thereby cause a switch-over of the operating frequency of said electromechanical means from said one non-zero frequency to said another non-zero frequency;

whereby the relative phase difference between said pulse train at nominal frequency and said monitor pulses is compensated for.

4,036,007

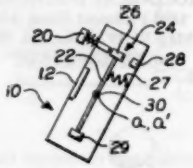
LIGHT EMITTING DIODE WATCH WITH ACCELERATION RESPONSIVE SWITCH

Edwin F. Shelley, 339 Oxford Road, New Rochelle, N.Y. 10804

Filed Aug. 13, 1975, Ser. No. 604,193

Int. Cl.[2] G04B *19/30*

U.S. Cl. 58—50 R **9 Claims**



1. An electronic watch including means for illuminating the time display, a battery, and an electric switch that closes to energize the means for illuminating the time display when a display of time is desired, characterized by the switch being constructed and oriented so that it is momentarily closed by the angular acceleration of a manual movement of the watch with the acceleration above a predetermined value, and further characterized by the switch having its various parts balanced and oriented so as to be responsive only to angular acceleration of the watch about an axis generally parallel to the direction of extent of the forearm on which the watch is worn, and further characterized by a band by which the watch is held on the wrist of a person using the watch with a digital face of the watch having the display figures in a row extending in a direction parallel to the direction of extent of the forearm of a person by whom the watch is worn as a wrist watch, the switch being within the watch and having a fixed contact, a movable contact and an inertia element, a movable element to which the movable contact and the inertia element are connected, means supporting the movable element for movement about an axis intermediate the movable contact and the inertia element and generally parallel to the direction of extent of the forearm of a person wearing the watch as a wrist watch so that the operation of the switch is responsive only to angular acceleration about said axis.

4,036,008

ELECTRONIC TIMEPIECE

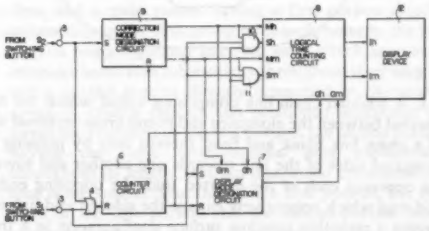
Yoshihiko Okamoto; Toshio Abe, both of Yokohama; Kazuhiro Hirose, Kawasaki; Saburo Nakajima, Kawasaki, and Hiroshi Saito, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 703,009

Claims priority, application Japan, July 7, 1975, 50-83333

Int. Cl.[2] G04B *27/00*

U.S. Cl. 58—85.5 **2 Claims**



1. An electronic timepiece provided with a counter circuit for producing a reset signal upon counting a predetermined number of clock pulses, whereby the operation mode of the timepiece is automatically switched from a correction mode in which power is consumed for the time display to a non-display

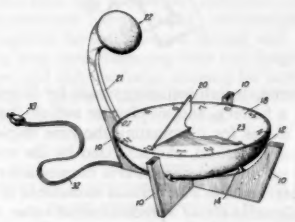
mode in which no power is consumed for the time display when the same data is displayed over a predetermined period in the correction mode.

4,036,009

HOROLOGICAL INSTRUMENT

Mark J. Sampson, 1390 Piedmont Road, Atlanta, Ga. 30309

Filed May 30, 1975, Ser. No. 582,173
Int. Cl.[2] G04B *19/06*
U.S. Cl. 58—127 R **4 Claims**



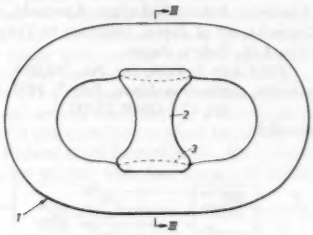
1. A horological instrument comprising a base, an electrically energizable light source rigidly mounted to said base, a dial, gnomon means for casting a shadow on said dial, and means for imparting relative movement between said electrically energizable light source and said dial which includes an electric motor mounted to said base with a motor output shaft coupled with said dial whereby the shadow is moved with respect to the dial for indicating time.

4,036,010

STUDDED CHAIN LINK

Bengt Hedman, Ljusne, Sweden, assignor to Bergvik och Ala Aktiebolag, Soderhamn, Sweden

Filed Apr. 2, 1976, Ser. No. 672,938
Claims priority, application Sweden, Apr. 10, 1975, 7504141
Int. Cl.[2] F16G *15/12*
U.S. Cl. 59—84 **3 Claims**



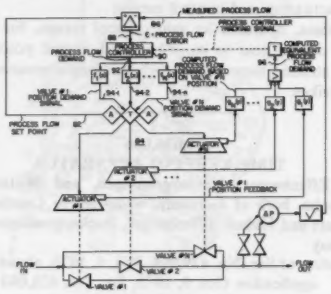
1. A studded chain link comprising a stud which has been inserted between the elongated and round cross-sectional sides of a chain link blank and fixed thereto only by pressing the elongated sides of the link towards one another and towards the opposing ends of the inserted stud, the opposing ends of said stud which respectively engage the sides of said link each having a smoothly concave surface configuration in a transverse plane passing through said stud in a direction perpendicular to the direction of extension on the link sides, and said opposing ends of said stud also having a smoothly concave surface configuration which is entirely concave in a longitudinal plane passing through said stud in the direction of extension of the link sides.

4,036,011

MULTIPLE VALVE SEQUENTIAL CONTROL FOR A COMBINED CYCLE POWER PLANT

Rash B. Gupta, West Deer Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1976, Ser. No. 653,045
Int. Cl.[2] F02C *7/02*; F01B *17/14*
U.S. Cl. 60—39.18 B **9 Claims**



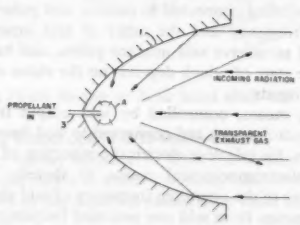
1. A multiple sequential valve control for at least two parallel valves which regulate the flow through a single path comprising an automatic flow control which generates an automatic flow demand in response to predetermined process variables in the automatic mode, means for generating a manual flow demand, a manual/automatic station for selectively transmitting the automatic or manual flow demand, means for controlling the position of a first valve over a first range of the path flow in response to the applied flow demand in accordance with a first flow/position characterization, means for controlling the position of a second valve over a second range of the path flow in response to the applied flow demand in accordance with a second flow/position characterization, means for sensing the position of each of said valves, means for generating an equivalent flow demand for said valves from outputs of said valve position sensing means, and means for coupling the equivalent flow demand to said automatic flow control in the manual mode to track the automatic flow control output to the manual demand and thereby enable bumpless manual/automatic transfer.

4,036,012

LASER POWERED ROCKET ENGINE USING A GASDYNAMIC WINDOW

Michael J. Monsler, Reading, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1976, Ser. No. 659,060
Int. Cl.[2] H05H *1/24*
U.S. Cl. 60—203 **3 Claims**



1. A power system for a vehicle comprising: a nozzle having a heating chamber and an exhaust outlet; a propellant; first means for providing said propellant to said heating chamber; a

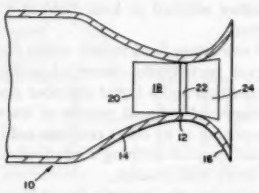
gasdynamic window in said heating chamber; said gasdynamic window formed by second means which exhausts propellant at supersonic speed across said window; laser radiation being directed through said gasdynamic window to said propellant for heating said propellant; said propellant having an unseeded portion which is transparent to the laser radiation and a seeded portion which is opaque to said laser radiation; said second means directing the propellant's unseeded portion across said window; an absorption zone inside said heating chamber remote from said window; and third means for directing said seeded portion of the propellant to said absorption zone without interferring with the laser radiation until reaching the absorption zone.

4,036,013

NOISE CONTROLLABLE NOZZLE CLOSURE

Robert E. Betts, Huntsville; Lawrence B. Thorn, Madison, and Albert R. Maykut, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 484,035, June 28, 1974, Pat. No. 3,968,646.
This application Dec. 22, 1975, Ser. No. 643,562
Int. Cl.[2] F02K *1/06, 1/24*
U.S. Cl. 60—271 **6 Claims**



1. In a rocket motor having a nozzle including an entrance section a throat section and an exit section, closure means for controlling the opening of said nozzle responsive to ignition of said rocket motor comprising:

a. a forward section disposed in said entrance section of said nozzle, said forward section having a cylindrical configuration, said forward section having a diameter substantially equal to the diameter of said throat;
b. an intermediate section disposed in said throat section; and,
c. an aft section disposed in said exit section of said nozzle,
d. said closure member having a predetermined density and mass for controlling the change of momentum of the closure member responsive to ejection thereof from said nozzle, whereby said nozzle opening is controlled incrementally or continuously.

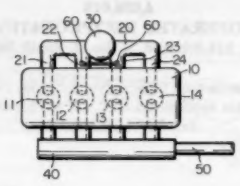
4,036,014

METHOD OF REDUCING EMISSION OF POLLUTANTS FROM MULTI-CYLINDER ENGINE

Hajime Ariga, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 474,331, May 29, 1974, abandoned.
This application Oct. 10, 1975, Ser. No. 618,402
Claims priority, application Japan, May 30, 1973, 48-60668
Int. Cl.[2] F02B *75/10;* **F02M** *23/04*
U.S. Cl. 60—274 **8 Claims**

1. A method of reducing concentration of oxides of nitrogen (NOx) in exhaust gas from a multi-cylinder internal-combustion engine comprising; supplying a first air-fuel mixture having a first air/fuel ratio lower than a stoichiometric ratio to a first group of engine cylinders consisting of of about half the number of total engine cylinders, supplying a second air-fuel mixture having a second air-fuel ratio higher than said stoichiometric ratio to a second group of engine cylinders consisting of the remaining engine cylinders, and mixing the exhaust gases from said first and second groups of engine cylinders with each other, each without any pretreatment, before emission into the atmosphere, wherein said first air-fuel mixture is prepared in a carburetor and said second air-fuel mixture is prepared by introducing air into said first air-fuel mixture while said first air-fuel mixture is flowing through intake manifold branches connected with said second group of engine cylinders.

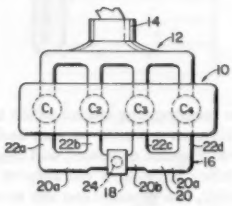


4,036,015

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yoshitaka Hata, Fujisawa; Giichi Shioyama, Yokosuka, and Hidehiro Minami, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 16, 1975, Ser. No. 578,129
Claims priority, application Japan, May 22, 1974, 49-58260
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—282 **2 Claims**



1. An in-line multi-cylinder internal combustion engine having a first group of cylinders consisting of at least half the number of total cylinders, the first group of cylinders being separated into two groups, and a second group of cylinders consisting of the remaining cylinders and being positioned between the two groups of the first group of cylinders, the engine being followed by an afterburner for burning the unburned consituents contained in the exhaust gases discharged from all the cylinders, comprising:

an intake manifold including a first group of branch runners connected to the first group of cylinders, a second group of branch runners connected to the second group of cylinders, and a main runner having a first portion directly connecting to the first group of branch runners, the first portion being separated into two parts which have same cross-sectional area substantially throughout their lengths, and a second portion directly connected to the second group of branch runners and positioned interposed between the two parts of the first portion, the second portion having the same cross-sectional area substantially throughout its length, said last mentioned cross-sectional area being smaller than that of the first portion, the two parts of the first portion and the second portion being axially aligned, and an induction opening through which an air-fuel mixture is inducted into said intake manifold; and

a carburetor for producing the air-fuel mixture and supplying the mixture into all the cylinders through said intake manifold, said carburetor having an air-fuel mixture induction passage which is communicated with the induc-

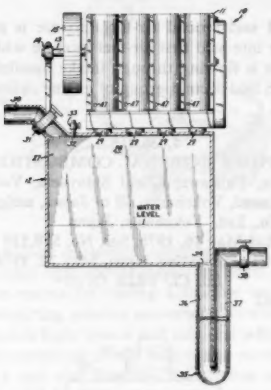
tion opening formed in the second portion of the main runner of said intake manifold.

4,036,016

VACUUM-OPERATED RECIPROCATING ENGINE

Louis Aldorfer, 144-8th Ave. S. No. 2, South Saint Paul, Minn. 55075

Continuation-in-part of Ser. No. 629,138, Nov. 5, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,054
Int. Cl.[2] F16D *31/02*
U.S. Cl. 60—325 9 Claims



1. A flame-free reciprocating engine which utilizes the pressure difference between a partial vacuum and ambient atmospheric pressure as a source of power, said engine comprising:

a. an engine block defining a plurality of cylinders each having an inner, low pressure end and an outer high pressure end;

b. a plurality of pistons each operating within a different one of said cylinders, each piston having a first face and a second face, said first face operating within an outer region of the respective cylinder which is maintained at atmospheric pressure and said second face operating within an inner region of the cylinder which is sealed from the ambient atmosphere, each of said pistons operating in a reciprocating manner within its respective cylinder between a first position wherein the volume of said inner region is minimized and the volume of said outer region is maximized, and a second position wherein the volume of said inner region is maximized and the volume of said outer region is minimized;

c. output means including an output shaft operatively connected to said pistons for translating the reciprocating motion of said pistons within said cylinders into rotary motion of said output shaft;

d. a flame-free vacuum means for selectively reducing the pressure within the inner region of each cylinder which is adjacent the second face of each piston to a pressure less than atmospheric pressure; and

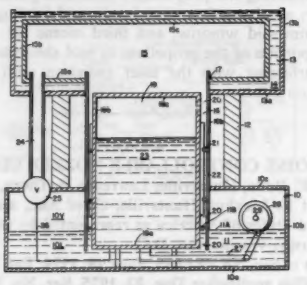
e. means for disconnecting said vacuum means from each cylinder and for permitting the intake of a limited amount of air into the inner region of each cylinder adjacent the second face of each piston, said means operating in timed relation to the operation of said engine such that air intake into each of said inner regions is sufficient to substantially equalize the pressure on both faces of a piston to allow it to be returned to its second position from which it can be driven to its first position by means of a pressure difference across said piston.

4,036,017

LOW PRESSURE ENGINE

Israel Siegel, 351 W. 71st St., New York, N.Y. 10023

Filed Jan. 19, 1976, Ser. No. 650,444
Int. Cl.[2] F03C *1/00*
U.S. Cl. 60—497 2 Claims



1. A low pressure engine comprising a warm chamber, adapted to keep liquid at a relatively warm temperature,

a cold chamber adapted to keep fluid at a relatively cold temperature,

a supply of activating fluid in said warm chamber having a liquid level partitioning warm chamber into a vapor chamber portion and a liquid chamber portion,

a conduit immersed in liquid portion of warm chamber said conduit opening at its other end into cold chamber,

a body in said conduit defining a relatively small interspace between body and conduit,

means for allowing the rise of a liquid in said interspace in response to vapor pressure,

a moving member responding to buoyant force exerted by said rising fluid,

means for temporary restraining of movement of said moving member until activating fluid has reached a predetermined level in interspace between conduit and body,

a vapor conducting conduit interconnecting the vapor portions of warm and cold chambers,

means for cyclic opening and closing said vapor conducting conduit to effect differences in vapor pressure between cold and warm chambers,

means for obtaining a temperature differential between cold and warm chambers,

force transmitting means operatively associated with said moving part for translating movements of moving part into useful work,

and a second high density fluid layer adapted to rise in interspace between body and conduit to increase the buoyant force per unit volume of the body.

4,036,018

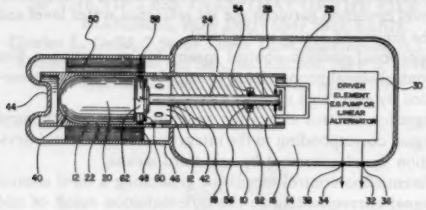
SELF-STARTING, FREE PISTON STIRLING ENGINE

William T. Beale, Rte. 4, Box 275, Athens, Ohio 45701

Filed Feb. 27, 1976, Ser. No. 661,979
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—520 14 Claims

1. A self-starting, free piston Stirling cycle engine having a housing enclosing a work space and a second space which are separated by a power piston reciprocally mounted in a cylinder and further having a displacer piston slidable in a displacer cylinder, the displacer piston having an attached displacer rod means slidably mounted to a bore means communicating between said work space and said second space, wherein the improvement comprises a first seal member sealingly slidable

along one of said means and resiliently attached to the other of said means by a resilient support which permits limited, non-



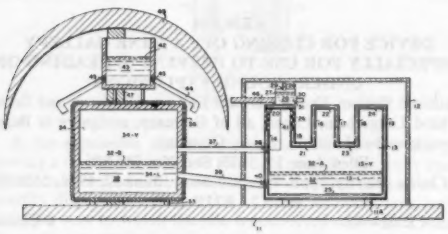
frictional movement of said seal member relative to the means to which it is attached.

4,036,019

SOLAR DIFFERENTIAL TEMPERATURE MOTOR

Israel Siegel, 351 W. 71 St., New York, N.Y. 10023

Filed Nov. 10, 1975, Ser. No. 630,705
Int. Cl.[2] F03G *7/04*
U.S. Cl. 60—531 1 Claim



1. A power producing unit consisting of a chamber containing an evaporating fluid dividing said chamber into a liquid chamber portion and a vapor chamber portion,
a moving part responding to vapor pressure changes in the chamber,
an outlet to allow the exit of vapor from said chamber,
means to allow opening and closing of said outlet to cause vapor pressure changes in said chamber, said means operatively associated with said moving part,
an inlet to allow entrance of liquid into said chamber,
a partition dividing said liquid chamber portion from said vapor liquid portion,
means to open and close said partition, said means operatively associated with said moving part,
and means for translating movement of said moving part into useful work.

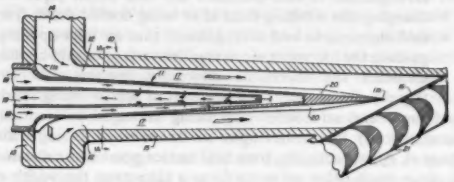
4,036,020

METHOD AND APPARATUS FOR PRODUCING A DIRECTED, HIGH-VELOCITY STREAM OF COMPRESSIBLE FLUID

Charles Stuart Bagley, 1314 Ohio Ave., Alamogordo, N. Mex. 88310

Filed Dec. 15, 1975, Ser. No. 640,872
Int. Cl.[2] F01D *25/08*
U.S. Cl. 60—644 16 Claims

1. Apparatus for producing a directed, high-velocity stream of compressible fluid, comprising an elongate nozzle having a flow passage therethrough extending from an inlet at one end of the nozzle to an outlet at the other end thereof and having a throat therebetween located near said inlet and dividing the nozzle into a relatively short inlet portion and a relatively long discharge portion, the effective cross-sectional area of the flow passage increasing from said throat to said outlet so as to provide for expansion of fluid flowing through the discharge portion of the nozzle to and through the outlet; means for supplying a compressible fluid to the inlet at greater pressure than the atmosphere into which it is discharged, so that said



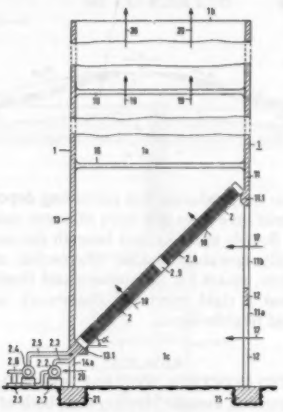
fluid flows through the flow passage; and means for heating the fluid as it flows through the discharge portion of the nozzle and expands therein.

4,036,021

POWER PLANT INCLUDING A COOLING TOWER SURROUNDING THE POWER PLANT SITE

Fritz Kelp, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Apr. 9, 1975, Ser. No. 566,398
Claims priority, application Germany, Apr. 9, 1974, 2417290
Int. Cl.[2] F28B *1/06*
U.S. Cl. 60—692 6 Claims



1. Power plant for converting primary energy into electrical energy including closed loop means for heating, pressurizing, expanding and cooling down a working fluid, which comprises:
a. an arrangement of power plant buildings located at the power plant site and including at least a central power station block;
b. a dry cooling tower having an inner wall being spaced with respect to and encompassing at least partially said arrangement and having an outer wall defining the exterior of said cooling tower and being arranged substantially in parallel relationship and spaced with respect to said inner wall, said inner and said outer wall defining a substantially annular channel having an air inlet at its lower end and an air exit at its upper end, said air inlet being formed by air inlet openings at the lower end of said outer wall, so that the cooling air entering said channel through said inlet openings flows upwardly through said channel towards said exit, said inner and said outer wall having a separate foundation erectable independently of the foundation of said arrangement;
c. heat exchanger means for cooling down the working fluid comprising cooling elements located within said channel

and being exposed to said cooling air stream, said elements being connected to inlet and outlet pipes, said inlet pipes supplying the working fluid to be cooled down from said arrangement to said elements and said outlet pipes discharging the working fluid after being cooled down from said elements to said arrangement; said air inlet openings guiding the incoming air across the surface of said cooling elements and therefrom upwardly towards said exit thereby dissipating the waste heat of said working fluid;

said inner and said outer wall being arranged substantially concentrically to a center point of said site and having a distance r_1, r_2, respectively, from said center point and a distance $r_{1,2}$ from each other so as to form a ring zone the width of which being relatively small as compared to the basis area of the power plant site, so as to prevent the break in of cold air and winds through the exit otherwise flowing reversely to the upward cooling air stream.

4,036,022

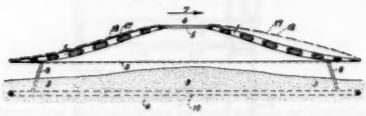
METHOD OF PRODUCING AND PROTECTING DEPOSITS OF SEDIMENTARY MATERIAL ON FLOORS OF BODIES OF WATER

Ole Jeppe Fjord Larsen, Auroravej 32A, Rodovre, Copenhagen, Denmark

Division of Ser. No. 133,720, April 13, 1971, Pat. No. 3,830,066, which is a continuation of Ser. No. 667,954, Sept. 15, 1967, abandoned. This application Aug. 9, 1974, Ser. No. 496,317

Int. Cl.[2] E02B *3/04*

U.S. Cl. 61—3 **28 Claims**



1. Apparatus for producing and protecting deposits of sedimentary material on a floor of a body of water, said apparatus comprising a flexible sheet located beneath the surface of the water in totally upwardly spaced relationship close to but above said floor, means for maintaining said flexible sheet so positioned, and a rigid apertured framework underlyingly supporting said flexible sheet.

4,036,023

FLOOD CONTROL SYSTEM FOR A DAM

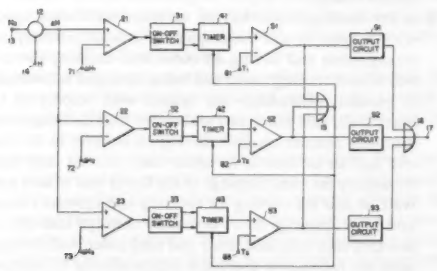
Kuniaki Matsumoto; Junichi Hatakeyama, both of Kokubunji, and Masaharu Okamoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 26, 1976, Ser. No. 708,634

Claims priority, application Japan, Aug. 1, 1975, 50-93099

Int. Cl.[2] E02B *7/40*

U.S. Cl. 61—25 **8 Claims**



1. A flood control system for a dam having a gate for controlling the water outflow therefrom comprising:

first means for setting a reference water level;

second means for measuring the actual water level;

third means responsive to said first and second means for generating a deviation signal corresponding to the water level deviation between the set reference water level and the measured actual water level;

proportional-position control means for generating a first control signal proportional to said deviation signal generated by said third means;

integration control means for generating a second control signal corresponding to the integration result of said deviation signal generated by said third means;

differentiation control means for generating a third control signal corresponding to the differentiation result of said deviation signal generated by said third means; and

fourth means for determining the outflow to be discharged from said dam in response to the sum of said first, second, and third control signals.

4,036,024

DEVICE FOR CLOSING OFF A MINE GALLERY ESPECIALLY FOR USE TO PREVENT SPREADING OF UNDERGROUND EXPLOSIONS

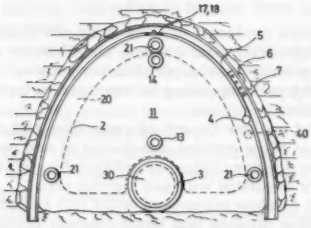
Raimund Dreker, Essen; Gerhard Endras, Augsburg, and Bernhard Langerbein, Lunen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed June 11, 1975, Ser. No. 585,806

Claims priority, application Germany, June 12, 1974, 2428290

Int. Cl.[2] E21F *5/00*

U.S. Cl. 61—42 **6 Claims**



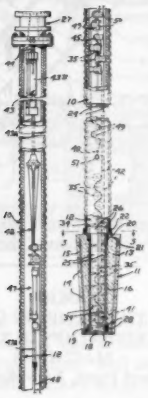
1. A device for closing off a mine gallery, especially for use to prevent spread of underground explosions, comprising a inflatable bag of flexible substantially airtight material and movable from a collapsed to an inflated position, said bag having in said inflated position a substantially cylindrical peripheral surface engaging an inner peripheral surface of the mine gallery and opposite curved end faces extending across the mine gallery, said peripheral surface having substantially midway between said end faces an annular constriction; a hardenable material filling, in said inflated position, the interior of said bag and said annular constriction so that the material in said annular constriction provides a seal and interlock between said bag and the surrounding face of the mine gallery; first conduit means communicating with the interior of the bag to inflate the latter first with a gas under pressure and subsequently with said material while the same second conduit means communicating with the interior of said annular constriction to fill the latter with said material while the same is in flowable and still unhardened condition; and at least one overpressure valve in an uppermost portion of the inflated bag to discharge the pressure gas during filling the bag with said hardenable material.

4,036,025

COMPOSITE PILE HAVING THE INSIDE DIAMETER OF THE TIP LESS THAN THAT OF THE PILE AND MANDREL FOR DRIVING THE SAME

Charles L. Guild, 7 Stone Tower Lane, Barrington, R.I. 02806

Continuation-in-part of Ser. No. 629,508, Nov. 6, 1975. This application Aug. 25, 1976, Ser. No. 717,510
Int. Cl.[2] E02D 7/30
U.S. Cl. 61—53.72 15 Claims



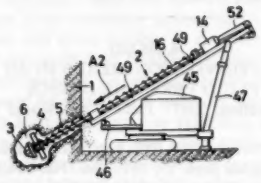
9. An expansible mandrel for use in driving a tubular pile having a tip attached thereto having a central, upwardly opening core provided with a seat at each end thereof and an upwardly disposed sleeve portion of cross sectional area larger than the core to which the pile is connected and within which the seats are exposed, said mandrel including lengthwise sections, a head interconnecting the upper ends of the sections, each section including a main portion for driving engagement with the interior of the pile, the tip portion of smaller cross section for driving engagement with the core, and an intermediate portion connecting said main and tip portions and establishing an outwardly projecting shoulder engageable with the upper seat of the pile tip, the length of the tip portions being coextensive with that of the core of the pile tip and each tip portion including at its lower ends, a boot portion engageable with the lower seat of the pile tip, expanding means within said mandrel operable to force the appropriate mandrel sections into their pile and core-gripping relationship and means operable to return said sections into their retracted position in which the pile and core are released.

4,036,026

METHOD AND APPARATUS FOR ESTABLISHING AN ANCHOR

Kingo Asayama, Hirakata, Japan, assignor to Kabushiki Kaisha Takechi Koumusho, Osaka, Japan

Division of Ser. No. 485,777, July 5, 1974, Pat. No. 3,973,409. This application Nov. 17, 1975, Ser. No. 632,448
Int. Cl.[2] E02D 5/74
U.S. Cl. 61—56.5 1 Claim



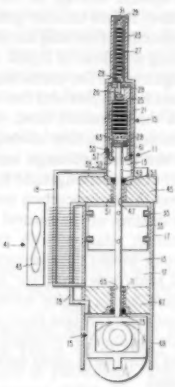
1. A method establishing an anchor inside a retaining wall from the outside thereof comprising the steps of providing an earth auger having an auger shaft, a rod having a thin synthetic resinous film and a detachably mounted boring head and radially expansible blades, rotating said earth auger to create an initial penetration bore, said rotation being in a direction to keep the blades retracted, at the bottom of the initial penetration bore reversing the direction of rotation of the auger to expand the blades, boring a radially enlarged opening starting at the bottom of the initial penetration bore, reversing the direction of rotation of the auger to retract the blades and detaching the auger shaft and its expansible blades from the boring head and its rod and withdrawing the same through the initial penetration opening while simultaneously introducing grout through the auger shaft to fill the enlarged opening and the initial penetration bore, allowing the grout to set, when the need for the anchor has ceased utilizing the resinous film as a parting agent, separating the rod from the boring head and withdrawing it from the grout for recovery and reuse.

4,036,027

LOST-MOTION REFRIGERATION DRIVE SYSTEM

Walter H. Bamberg, Stoughton, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed Apr. 30, 1976, Ser. No. 681,936
Int. Cl.[2] F25B 9/00
U.S. Cl. 62—6 9 Claims



1. In a refrigeration apparatus of the type including a sealed working volume defined by intercommunicated first and second elongated vessels having first and second piston elements reciprocating axially therein, the improvement:

said first and second intercommunicated elongated vessels being positioned in a line along a single axis having at least one fixed sealing wall positioned therebetween;

an axially-moveable rod being included extending along said axis through a sliding seal in said sealing wall connecting said first and second piston elements;

a coupling means for coupling said rod with said second piston element but allowing lost axial motion of said rod relative to said second piston element without a corresponding motion of said second piston element over a portion of the axial travel of said rod in both directions;

an intercommunicating passage for joining a first end of said first elongated vessel to a first end of said second elongated vessel; and

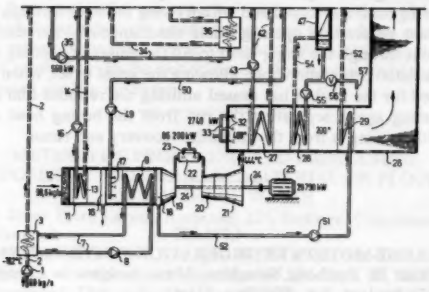
an energy source for driving said shaft to reciprocate axially.

4,036,028

PROCESS AND APPARATUS FOR EVAPORATING AND HEATING LIQUIFIED NATURAL GAS

Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 30, 1975, Ser. No. 627,331
Claims priority, application Switzerland, Nov. 22, 1974, 15545/74
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—52 7 Claims



1. An apparatus for evaporating and heating liquid natural gas comprising

means defining a predetermined flow path for a flow of liquid natural gas;

an open gas turbine system having an air intake and an exhaust flue for a flow of hot exhaust gases;

a first heat exchange system for cooling air taken into said air intake and for heating the flow of liquid natural gas;

a second heat exchange system for extracting heat from the flow of exhaust gases in said flue and for heating the flow of natural gas with the extracted heat, said second heat exchange system including a first closed piping system having a hydrocarbon heat exchange medium therein, a first heat exchanger for receiving heat from the flow of exhaust gases to heat the hydrocarbon medium, a second heat exchanger for heating of the natural gas in said flow path in heat exchange relation with the hydrocarbon medium, a compressor means downstream of said second heat exchanger in said flow path for compressing the hydrocarbon medium and a vapor turbine upstream of said second heat exchanger in said flow path for expanding the hydrocarbon medium to produce work;

means for admixing an anti-freeze agent into said gas turbine system air intake; and

a rectifying means for receiving and vaporizing the anti-freeze agent downstream of said air intake, said rectifying means having a head product removal line connected to a third heat exchanger in said first closed piping system for receiving heat from the flow of exhaust gas.

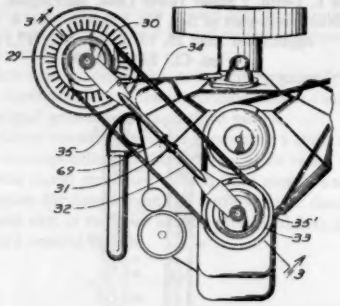
4,036,029

AIR CONDITIONING UNIT FOR AUTOMOBILES

Philip L. Francis, 4812 Estrada Da Costa, Sarasota, Fla. 33581

Filed June 25, 1975, Ser. No. 590,324
Int. Cl.[2] B60H 3/04
U.S. Cl. 62—243 8 Claims

1. An air conditioning unit comprising a compressor condenser and evaporator, an outer casing for said compressor, said condenser and evaporator circular in shape and mounted upon the outer casing of said compressor, a shaft for rotating said compressor condenser and evaporator as a single unit, said shaft for rotating the compressor connected to one end of said outer casing of the compressor, said compressor casing including a plurality of interior cylinders, pistons reciprocally mounted in said cylinders, a second shaft extending through the compressor, means on said second shaft for reciprocating said pistons, a brake for controlling rotation of said second



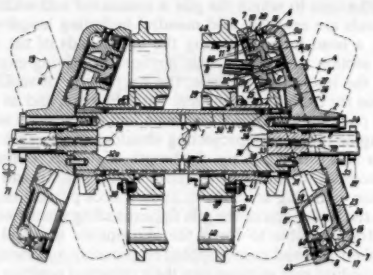
shaft whereby the reciprocation of said pistons may be controlled independently of rotation of the compressor casing.

4,036,030

ASSEMBLY FOR THE DAMPING OF FLEXURAL AND TORSIONAL VIBRATION IN THE SHAFTS OF MACHINES

Hermann Ernst Robert Papst, Karl-Maier-Strasse 1, St. Georgen, Germany

Filed Sept. 16, 1974, Ser. No. 506,043
Claims priority, application Germany, Sept. 18, 1973, 2346969
Int. Cl.[2] F16C 1/00, 3/00
U.S. Cl. 64—1 V 15 Claims



1. An assembly for the damping of flexural and torsional vibrations in a rotatable machine shaft which extends between a pair of spaced bearings, the improvement comprising:

a bend resistant tubular member surrounding said shaft,

means for rotating said tubular member in the same direction and at substantially the same speed as said shaft,

a minute clearance defined between said shaft and tubular member between said bearings,

a viscous damping medium filling said clearance, and

supply means for supplying said clearance with said medium under pressure through said shaft.

4,036,031

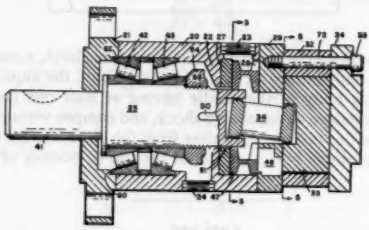
UNIVERSAL CONNECTION MEANS IN AN ORBITAL FLUID PRESSURE DEVICE

George V. Woodling, 22077 Lake Road, Rocky River, Ohio 44116

Continuation of Ser. No. 494,057, Aug. 2, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,145
Int. Cl. F16d 3/18
U.S. Cl. 64—7 27 Claims

1. Universal connections means between first and second

rotatable body means is an orbital fluid pressure device, said first body means having a first body axis, said second body means having a second body axis, said first body axis and said second body axis being disposed to intersect each other at an universal point, one of said body means including an internal polygonal socket configuration and the other body means including an external polygonal head configuration, said internal and external polygonal configurations interfittingly engaging each other for transmitting torque therebetween in a torque transmitting direction, said polygonal configurations providing universal relative movement therebetween in all directions



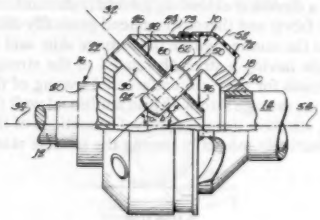
other than in said torque transmitting directions, said polygonal configurations including at least an internal torque transfer wall and an external torque transfer wall confrontingly engaging each other, one of said transfer walls comprising substantially flat wall means and the other comprising substantially contour wall means, said flat wall means and said contour wall means having freedom from both interference upon relative universal movement therebetween, said flat wall means and said contour wall means upon transmission of torque defining at least a polygonally disposed line segment contact therebetween.

4,036,032

UNIVERSAL JOINT

Metin Mustafa Durum, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 5, 1975, Ser. No. 637,903
Int. Cl.² F16D 3/30
U.S. Cl. 64—21 **9 Claims**



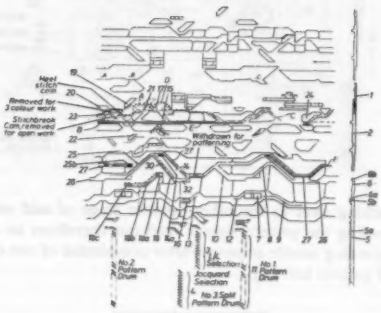
1. A universal joint for the transmission of torque between two shafts comprising a drum member coupled to one of said shafts, at least three trunnions connected to and extending inwardly from said drum member at an acute angle with respect to said one shaft, said trunnions having an end remote from said drum member, a coupling member rotationally and slidably mounted on each of said trunnions, said groove member having at least three grooves extending inwardly at an acute angle with respect to said other shaft, said coupling members being received within said grooves whereby torque can be transmitted between said shafts when said shafts are at an angle, and said trunnions being secured together at said remote ends.

4,036,033

PLURAL CAM TRACKS FOR ROCKABLE JACKS

Leslie William Digby Jesson, Leicester, England, assignor to The Bentley Engineering Company, Ltd., England

Filed June 30, 1975, Ser. No. 591,648
Claims priority, application United Kingdom, July 11, 1974, 30679/74
Int. Cl.² D04B 9/10, 15/68
U.S. Cl. 66—14 **11 Claims**



1. Circular knitting machine comprising a cylinder, tricks in the cylinder, rockable jacks in the tricks, a butt at each end of the rockable jacks, the butts at each end of the individual jacks being alternatively projectable from the tricks by rocking of the jacks, selection means and cam means for sliding a first group of rockable jacks in the tricks and for sliding a second group of the jacks differently from the first group, the cam means defining a first track portion ending at a first position, a second portion starting at a second position spaced in a trickwise direction from said first position by the distance between the alternatively projectable butts, first means for rocking those individual jacks having alternatively projectable butts at the first and second position, and the cam means further defining a third track portion passing between the first and second positions.

4,036,034

ELECTRONIC METHOD AND APPARATUS FOR PATTERN FORMATION IN CIRCULAR KNITTING MACHINE

Noboru Aisaka; Tadashi Shindo, both of Yokohama, and Tatsuya Kawakami, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 554,310, Feb. 28, 1975, abandoned, which is a continuation of Ser. No. 295,100, Oct. 5, 1972, abandoned, which is a continuation of Ser. No. 53,365, July 6, 1970, abandoned. This application Feb. 27, 1976, Ser. No. 662,167
Claims priority, application Japan, July 7, 1969, 44-53918
Int. Cl.² D04B 9/00
U.S. Cl. 66—50 R **11 Claims**

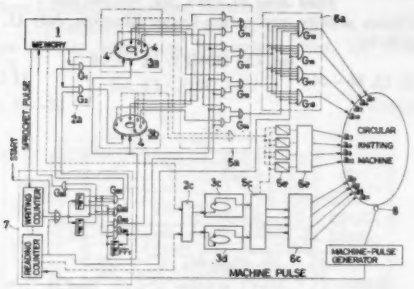
1. A method of pattern formation in a circular knitting machine provided with a set of selectively operable needle actuators rotatable relatively to an annular array of knitting needles, comprising the steps of:

storing in a memory device pattern signals given in binary notation for a desired pattern to be knitted;

alternatingly writing the pattern signals stored in said memory device into first one and then the other of a pair of counter stages;

reading out the stored pattern signals for one course of pattern knitting from one counter stage of said pair simultaneously with the writing of the stored pattern signals for the next course of pattern knitting in the other counter stage of said pair;

feeding the pattern signals read out from said one counter stage of said pair to corresponding needle actuators; and



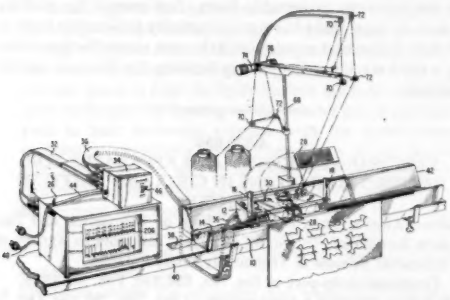
switching over to the other counter stage of said pair for feeding the pattern signals read out therefrom to corresponding needle actuators after completion of one course of pattern knitting.

4,036,035

AUTOMATED HOME KNITTING MACHINE

William Kahan, New York, N.Y.; John Vernon Landau, Jr., Mount Lakes, N.J.; Howard David Rogers, Fanwood, N.J.; Fredrick Alexander Rupinski, Lyndhurst, N.J.; Thomas Richard Peer, Glenwood, N.J., and Martin David Brennan, Flanders, N.J., assignors to The Singer Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,431
Int. Cl.[2] B04D *7/00, 15/66*
U.S. Cl. 66—75.2 **51 Claims**



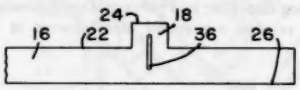
1. In a knitting machine, the combination comprising a needle bed supporting a plurality of needles in side by side relation; a carriage mounted on the bed for movement traversing such needles, the carriage including needle actuating camming; a program card including individual stitch instructions within one area of the card for a design shape to be repetitively formed in fabric to be knit on the machine, and other instructions outside the design area for controlling the knitting of said fabric; means for reading out the instructions in both of said areas of the program card; electronic control means connected with the reading means, the electronic control means being adapted to store signals representing instructions on the program card; a pulse generator on the carriage operable in timed relation to movement of the carriage, and needle actuating means on the carriage operable in synchronism with the pulse generator and responsive to the operation of said electronic control means for selectively determining paths for the needles through the said needle actuating camming according to the instructions on the card in and outside the design area.

4,036,036

LATCH NEEDLE FOR KNITTING MACHINES

Albert Sidney Ashmead, Torrington; William Alden Ross, New Hartford, and Richard Wilton Shepard, Torrington, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Mar. 22, 1976, Ser. No. 669,401
Int. Cl.[2] D04B *35/02, 35/04*
U.S. Cl. 66—123 **5 Claims**



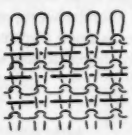
1. In a latch needle having a hook, a pivotable latch, a roundout, and a body consisting of a blade and a butt, the improvement of the body of the needle having at least one lateral opening to relieve stress, absorb shock, and dampen vibrations; said at least one opening extending from the blade into the butt and located so as not to extend to the top or bottom of the body.

4,036,037

KNITTED TEXTILE CASING FOR SAUSAGES

Gebhard R. Huckfeldt, Oestmannstreppe 1, 2000 Hamburg 55, Germany

Filed July 14, 1975, Ser. No. 595,803
Claims priority, application Germany, July 13, 1974, 2433751
Int. Cl.[2] A22C *13/00*
U.S. Cl. 66—170 **6 Claims**



1. In a tubular sausage casing providing a sausage skin for containing sausage therein comprising a reinforcing tubular base fabric and a coating in interlocking association therewith and together providing said sausage skin, the improvement wherein the tubular base fabric comprises a tubular textile knitted fabric of knitted threads and additional weft threads running in a direction extending generally circumferentially of the tubular fabric and thereby to extend generally circumferentially about the sausage within the sausage skin, said additional weft threads having a strength related to the strength of the knitted threads for eaay circumferential tearing of the knitted threads of the sausage skin with said additional weft threads for permitting selective manual removal of sections of the sausage skin by selectively manually tearing the sausage skin from the sausage.

4,036,038

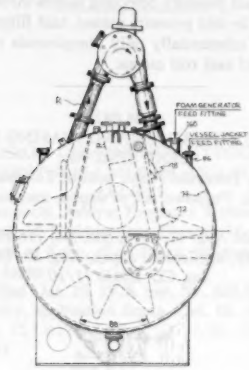
APPARATUS FOR LOW LIQUOR RATIO WET PROCESSING OF TEXTILE FABRIC

Christoph W. Aurich, Clemson, S.C.; William Cleere Sturkey, Charlotte, and James Keith Turner, Lincolnton, both of N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed May 20, 1976, Ser. No. 688,189
Int. Cl.[2] D06B *3/28*
U.S. Cl. 68—5 C **11 Claims**

1. In apparatus for low liquor ratio wet processing of textile fabric in endless loop form while recirculating the fabric loop through a processing system including a vessel arrange for transiently storing a major portion of said fabric loop and a superstructure for said vessel disposed and equipped for progressively withdrawing the fabric loop from and returning it to

the vessel storage to effect said fabric recirculation, the improvement with comprises a lifter roll and selectively operable aspirating means housed in said superstructue and to cause recirculating travel of the fabric loop, a foam generator mounted on said vessel, means for applying a low liquor ratio foaming formulation of the processing liquor externally to said recirculating fabric in a non-persistently foamed condition by feeding processing liquor under pressure selectively to either



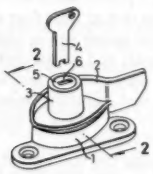
or both of said aspirating means and said foam generator adjacent the point of fabric return to said vessel storage so that the foamed processing liquor tends to decay to liquid phase in the course of migratory saturation of the stored fabric portion as it progresses through said vessel, and means for recovering a decayed liquid phase of said foamed processing liquor from said vessel and for continually recycling the recovered liquor to said applying means for reapplication to non-persistently foamed condition to said recirculating fabric.

4,036,039

SASH LOCK

Yoshitaka Nakanishi, 12-9, Yawata 5-chome, Ichikawa, Chiba, Japan

Filed Dec. 24, 1975, Ser. No. 643,945
Claims priority, application Japan, Dec. 28, 1974, 50-2435[U]
Int. Cl.[2] E05B *63/14, 47/00*
U.S. Cl. 70—90 **15 Claims**



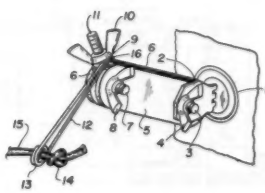
1. A sash lock, comprising; a base; a rotatable latch cam pivoted to the base; a locking member disposed on the latch for unlockably locking the latch cam to control rotation thereof; a rotatable actuating member disposed on the locking member; and a key for rotating the actuating member to shift the locking member into and between locking and unlocking positions thereof, each of said members having a cam surface, one such surface being engageable with the other and normally engaged therewith to derive from the rotating of the actuating member a rectilinear motion of the locking member between the locking and unlocking positions thereof, and wherein each cam surface has a recessed flat cam surface portion, an inclined cam surface portion connected to said recessed one, and a projecting flat cam surface portion connected to said inclined one so that, when the projecting flat cam surface portions are mutually engaged, the locking member is in the locking position, and when a projecting flat cam surface portion and a recessed flat cam surface portion are mutually engaged, the locking member is in the unlocking position thereof.

4,036,040

REMOTE CONTROL DEVICE FOR KEY ACTUATED SYSTEMS

Carmelo C. Graizzaffi, 22 Foster Road, Lake Bonkonkoma, N.Y. 11779

Filed Aug. 8, 1975, Ser. No. 603,248
Int. Cl.[2] E05B *17/00;* A47G *29/10*
U.S. Cl. 70—431 **7 Claims**



1. A remote control device for key actuated ignition systems comprising:

a. an adjustable arm having a first and a second end,
b. holding means adapted to hold a key,
c. linking means to connect the holding means to the first end of said arm, the key and arm positions being separately adjustable to place the key axis at a selected angle with respect to the axis of the arm, and
d. a flexible line secured to the second end of the adjustable arm, and

wherein said linking means comprises a body member having a first and a second end, a first coupling means attached to the first end of said body member to connect said holding means to said body member, and a second coupling means attached to the second end of said body member to connect said arm to said body member, and said first and second coupling means including separate means for securing said holding means and arm to the body member at respective selected positions, and

wherein said body member includes a first hole adjacent its first end and a second hold adjacent its second end, said first coupling means comprises a first fastening means having a shaft and a head on one end of shaft, such as a bolt, the shaft portion of which is positioned in the first hole in said body member and passes through a hole in the head of the key, and

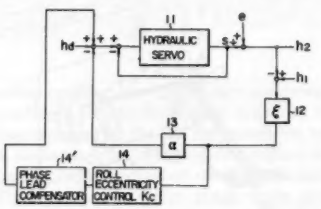
wherein the arm includes a first hole at the end adjacent the body member and said second coupling means comprises a second fastening means having a shaft with a head on one end, such as a bolt, second and third adjustable securing means such as nuts, and a third fastening means having a shaft and an eye at one end of the shaft such as an eye bolt, the shaft portion of said second fastening means being located in the second hole in said body member and passing through the eye of the third fastening means, the second securing means being attached to the second fastening means at an adjustable point on the shaft towards the end opposite the head to secure the third fastening means to said body member, the shaft portion of the third fastening means passing through the first hole in the arm, and said third securing means being attached to the third fastening means at an adjustable point on the shaft towards the end opposite the eye to secure said arm to said body member, whereby said key may be set to any angle about said first fastening means, said third fastening means may be set to any angle within a 180° range about said second fastening means and said arm may be set to any angle about said third fastening means.

4,036,041

GAGE CONTROL SYSTEM FOR ROLLING MILL

Ken Ichiryu, Mito; Toyotsugu Masuda, Hitachi; Haruo Kinoshita, Hitachi; Toshiyuki Kajiwara, Hitachi, and Shigemichi Matsuka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1976, Ser. No. 657,271
Claims priority, application Japan, Feb. 12, 1975, 50-16872
Int. Cl.² B21B *37/00*
U.S. Cl. 72—8 **15 Claims**



1. A gage control system for use with a rolling mill comprising roll means for defining a roll gap through which a material is passed to be rolled and hydraulic pressure means adapted to set the roll gap at a given value and to control a rolling pressure applied through said roll means to the material passing through said roll gap, said system comprising:

gap setting means for applying a gage command to said pressure means to set the roll gap at a predetermined value,

position setting means for detecting the actual value of the roll gap and feeding back a gap signal corresponding to the actual value of the roll gap to said pressure means,

pressure detecting means for detecting the rolling pressure applied to the material passing through the roll gap and determining the amount of deformation of said rolling mill from the detected rolling pressure,

multiplier means for multiplying the output of said pressure detecting means relating to the amount of said deformation by a predetermined coefficient and applying, as a negative back, the result of said multiplication to said pressure means, and

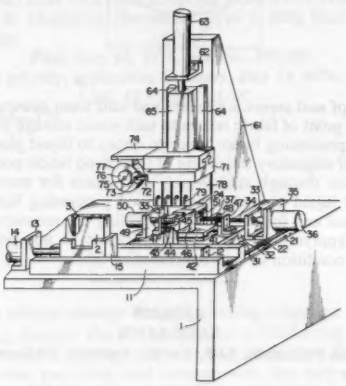
feed back means for applying, as positive feed back, the output of said pressure detecting means through a narrow-band filter to said pressure means, said filter allowing the passage of substantially only components relating to eccentricity of said roll means.

4,036,042

APPARATUS FOR ADJUSTING BIASING FORCE OF LEAF SPRING

Hitoshi Kubota; Takayuki Nishi, both of Yokohama, and Takashi Kobayashi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,157
Claims priority, application Japan, Aug. 20, 1975, 50-100211
Int. Cl.² B21D *11/10*
U.S. Cl. 72—9 **2 Claims**



1. An apparatus for adjusting biasing force of a leaf spring comprising:

a. means for adjusting said biasing force through imparting to said leaf spring a plastic deformation, said biasing force adjusting means having at least four stationary rollers for supporting said leaf spring and at least two movable rollers adapted to impart said plastic deformation to said leaf spring while it is supported by said stationary rollers;

b. means carrying said adjusting means for moving said stationary and movable rollers of said adjusting means to and from said leaf spring;

c. means for measuring the biasing force of said leaf spring having at least one measuring element adapted to make one reciprocating movement between a stand-by position where it does not contact said leaf spring and a measuring position where said leaf spring is deflected by said measuring element by a predetermined amount;

d. a sequence control circuit for controlling the operation of said measuring means; and

e. control circuit means connected to said measuring element of said measuring means and to said stationary and movable rollers of said adjusting means, said control circuit means being adapted to compare the measured biasing force of said leaf spring with a reference value to decide whether the measured biasing force is acceptable, to determine the direction in which the plastic deformation is to be imparted and the amount of deformation to be im-

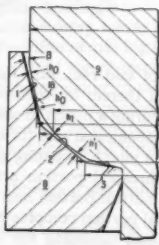
parted when said biasing force is decided to be unacceptable, and to control said adjusting means and said means for moving said stationary and movable rollers in accordance with the determined direction and amount thereby to adjust the biasing force of said leaf spring.

4,036,043

EXTRUSION DIE FOR HOT HYDROSTATIC EXTRUSION OF ALUMINUM AND ALUMINUM ALLOYS

Yoshihiro Yamaguchi, Ashiya; Tomiharu Matsushita; Masataka Noguchi, both of Nishinomiya; Hideaki Ide, and Kunihiko Nishioka, both of Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Oct. 20, 1975, Ser. No. 623,631
Claims priority, application Japan, Oct. 18, 1974, 49-119924
Int. Cl.[2] B21C *3/10, 9/00, 23/32, 25/02*
U.S. Cl. 72—41 9 Claims



1. A die for use in a hot hydrostatic extrusion process, in which a billet comprising aluminum or an aluminum alloy or a billet having aluminum and an aluminum alloy at its outer periphery is preheated and charged into a container whereupon extrusion is carried out by means of a pressure medium, said die having a inlet portion and an outlet portion and comprising:

a plurality of contiguous stepped conical portions serving as approach portions to said die outlet;

said conical portions having conical surfaces whose opening angles increase from said inlet of said die toward said outlet thereof, said conical surface which is closest to said die inlet having an opening angle of less than 60°, and the difference between the opening angles between adjacent conical surfaces being less than 90°;

said conical surface closest to said die inlet defining an open area into which said pressure medium may be initially introduced between said conical surface closest to said die inlet and said billet; and

said contiguous conical surfaces define annular pockets between said contiguous conical portions and said billet for housing pools of said pressure medium;

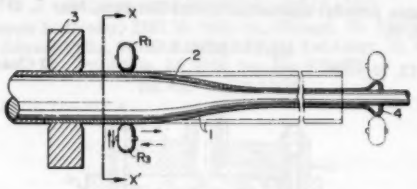
whereby during said extrusion, said pressure medium enters the area defined between said billet and said conical surface closest to said die inlet so as to prevent the formation of dead metal and is also extracted from said pockets so as to enter the area defined between said billet and said conical surfaces so as to lubricate said billet thereby preventing seizure thereof within said die.

4,036,044

PROCESS FOR FORMING METAL PIPES TO A DESIRED SHAPE

Tomio Yoshimura, Osaka, Japan, assignor to Zenzo Matsunaga, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,940
Claims priority, application Japan, Apr. 7, 1975, 50-41990
Int. Cl.[2] B21B *19/12*
U.S. Cl. 72—85 1 Claim



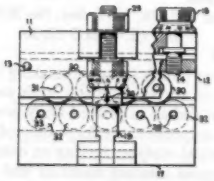
1. A process for forming metal pipes to a desired shape comprising fitting a metal pipe onto a model having same profile as the one desired to form, fixing the pipe on the model, arranging a plurality of metal rollers at the same distance and around the metal pipe in such a manner that these rollers are in contact with the pipe always keeping their centers on the circumference of a concentric circle and on a plane perpendicular to the longitudinal center axis of the model irrespective of the change in their position during their forward and backward movement relative to and their left or right-ward movement along the longtudinal center axis of the model, each of said metal rollers being provided with a driving means so that each of said rollers may be forcibly driven, and rotating the metal pipe integral with the model in the longitudinal direction while forcing the rollers to move relative to and along the longitudinal center axis of the model to thereby form the metal pipe to a desired shape.

4,036,045

CALIBRATED ADJUSTABLE ROLL STRAIGHTENER FOR WIRE

Emmett P. Ham, and Albert S. Johnson, Jr., both of Goldsboro, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed July 14, 1976, Ser. No. 705,344
Int. Cl.[2] B21D *3/02*
U.S. Cl. 72—165 6 Claims



1. A wire straightener comprising:

a frame having two parts;

first pivot means joining said parts at one side thereof;

offset adjusting means interconnecting the sides of said parts opposite said first pivot means;

a first support means having a plurality of rolls in fixed spatial relation;

a second support means, comprising one of said parts, having a plurality of rolls in fixed spatial relation;

second pivot means for locating one end of each of said support means relative to the other; and

pitch adjusting means coupled to the other ends of said

support means for controlling the spacing of said other ends.

4,036,046

WIRE DRAWING

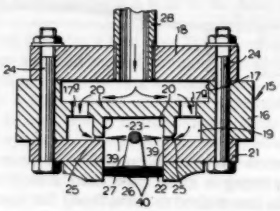
Peter Gough Davies, Cardiff; Keith Thomas Jones, Blackwood, and Brian Salmon, Cardiff, all of England, assignors to GKN Somerset Wire Limited, England

Filed Apr. 28, 1976, Ser. No. 681,256

Claims priority, application United Kingdom, May 7, 1975, 19080/75

Int. Cl.[2] B21C 9/00

U.S. Cl. 72—286 **22 Claims**



1. Apparatus for wire drawing comprising a die and a rotatable block around which the filament leaving the die is arranged to be wrapped, the apparatus including means located between the die and the block for cooling the filament using a liquid coolant and a wiping means for wiping substantially all the liquid coolant from the filament before the latter passes onto the block, said cooling means comprising an elongated chamber through which the filament is arranged to pass whilst in a substantially straight configuration and moving in the direction of its length, said chamber being provided with nozzles arranged to direct jets of the liquid coolant onto the straight moving filament and with a slot which extends longitudinally from one end of the chamber to the other, a deformable baffle which forms part of the wall of the chamber extending across said slot and the arrangement allowing a substantially straight length of filament to be inserted into and withdrawn from the chamber through said slot by movement of said straight length relative to the chamber in a direction substantially at right angles to the longitudinal axis of said straight length thus deflecting said baffle.

4,036,047

BODYMAKER PUNCH AND RAM

Edward C. Miller, Broomfield, Colo., assignor to Ball Corporation, Muncie, Ind.

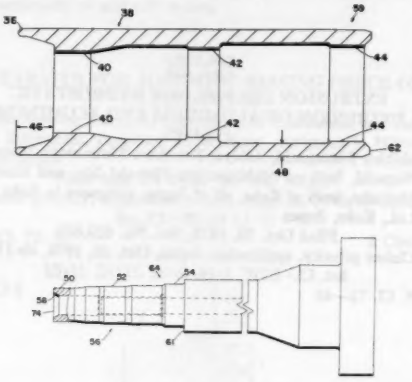
Filed Oct. 28, 1975, Ser. No. 626,676

Int. Cl.[2] B21D 22/21

U.S. Cl. 72—347 **6 Claims**

3. A bodymaker punch for use in making bodies, said punch comprising a nose for engagement with and deformation of said can material and an improved body portion for strengthening said body to prevent breakage thereof, said punch being a hollow cylindrical member having an external diameter and a first and a second internal diameter and further having at least first and second lands disposed about the interior surface thereof said first land having a first internal diameter and said second land having a second internal diameter, a first of said lands being disposed adjacent said nose to thus increase the cross-section of said body portion at this location; a second of said lands being disposed near the end of said body portion most remote from said nose and wherein the difference between said first internal diameter of said first land and the first internal diameter of said punch is greater than the difference between said second internal diameter of said second land and said second internal diameter of said punch; said first land being disposed along a portion of the interior surface of said body having said first internal diameter and said second land being disposed along a portion of the interior surface of said body having said second internal diameter, said first internal diameter being less than said second internal diameter.

4. A ram for supporting a bodymaker punch for use in making can bodies wherein said ram has an improved body portion for engagement with and support of said punch, said ram having a plurality of lands disposed along the external length thereof, a first of said lands being disposed at the rearward moving end of said ram and having an external diameter which is greater than the external diameter of said first land to thereby increase the mass of material in said ram at said rearward moving end; a second of said lands being disposed at the



forward moving end of said ram, said forward moving end having means disposed therein for securing a punch to said ram, said means for securing a punch to said ram comprising a cylindrical, axial bore opening at said forward moving end of said ram for receiving a punch mounting nut, said cylindrical, axial bore having a threaded portion nearer said rearward moving end and a cylindrical portion near said forward moving end, said cylindrical portion complementing a similar portion disposed on a punch mounting nut for receiving therethrough the punch mounting nut, said cylindrical portion being of sufficient length and diameter to cause forces subjected on said punch by said punch mounting nut to be equally distributed.

4,036,048

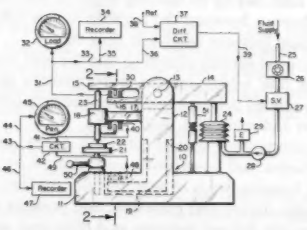
HARDNESS TESTING DEVICE

Robert A. Webster, 1044 20th St., Unit N, Santa Monica, Calif. 90403

Filed Jan. 21, 1977, Ser. No. 760,945

Int. Cl.[2] G01N 3/42

U.S. Cl. 73—81 **5 Claims**



3. A hardness testing device including, in combination:

a. a frame body having an horizontal base and a central upwardly extending portion carrying a pivot shaft;

b. a cross beam centrally pivoted to said pivot shaft, one end

of said beam on one side of said pivot shaft being forked to define an upper bending beam portion and a lower reference beam portion extending in substantially parallel vertically spaced relationship;

c. said frame body including an arm integrally secured to and horizontally extending from said central upwardly extending portion beneath said reference beam, said arm terminating in a vertical guide bearing;

d. said frame body including a leg secured to and horizontally extending from a lower portion of said central upwardly extending portion adjacent to said horizontal base in spaced relationship thereto;

e. A specimen platform supported on said horizontal base of said frame body beneath said guide bearing;

f. a penetrating probe vertically movable in said guide bearing with its upper end engaging the underside end portion of said bending beam and its lower end engaging a specimen receivable on said platform;

g. force applying means between the other end of said cross beam on the other side of said pivot shaft and said horizontal base;

h. first electrical measuring means connected between said bending beam portion and said reference beam portion of said cross beam providing a first signal responsive to movement of said bending beam relative to said reference beam;

i. second electrical measuring means connected between said penetrating probe and said arm for providing a second signal responsive to movement of said probe relative to said vertical guide bearing;

j. third electrical measuring means connected between the extending end portion of said leg and said horizontal base for providing a third signal responsive to movement of said horizontal base relative to said leg;

k. first indicating means responsive to said first signal to provide an indication of the force applied to said probe resulting from application of force by said force applying means;

l. circuit means subtracting said third signal from said second signal; and

m. second indicating means connected to said circuit means and responsive to an output signal from said circuit means constituting the difference between said second signal and third signal to provide an indication of the penetration of said penetrating probe into said specimen.

4,036,049

METHOD FOR DETERMINING ENGINE MOMENT OF INERTIA

Richard Eric Hanson, Winchester, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,650

Int. Cl.² G01M *15/00*

U.S. Cl. 73—116 **1 Claim**

1. A method of determining the rotational moment of inertia of an engine type power plant, comprising the steps of

running an unloaded power plant up to a high speed of approximately 2500 r.p.m., de-energizing the power plant of decelerate same from said high speed to a low speed of approximately 1000 r.p.m., and measuring the elaspsed time period, to thereby ascertain the average deceleration rate of the unloaded power plant;

applying a known external load to the power plant; said external load being approximately 10 percent of the power plant friction torque;

running the loaded power plant up to the same aforementioned high speed, de-energizing the loaded power plant to decelerate same from the aforementioned high speed to the same aforementioned low speed, and measuring the elasped time period, to thereby ascertain the average deceleration rate of the loaded power plant;

and calculating the moment of inertia according to the equation $I = F_A/(d_2 - d_1)$

where

I is moment of inertia

F_A is the known external load

d_2 is deceleration rate of the loaded power plant, and

d_1 is deceleration rate of the unloaded power plant.

4,036,050

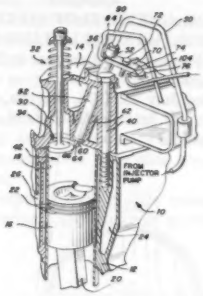
ENGINE MONITORING APPARATUS

Joseph L. Dooley, 2753 W. 84th St., Chicago, Ill. 60652, and Edward Yelke, 945 S. Kensington Ave., LaGrange, Ill. 60525

Filed Mar. 24, 1976, Ser. No. 670,058

Int. Cl.² G01M *15/00*

U.S. Cl. 73—119 A **10 Claims**



1. A performance monitoring system for engines having one or more cylinders adapted to receive fuel injected through a nozzle which is pressure seated into a cylinder inlet port, said system comprising holding means adapted for engaging said nozzle and maintaining pressure tending to seat said nozzle against said port, and transducer means operatively associated with said holding means for generating an electrical signal in response to changes in pressure within said cylinder.

4,036,051

HEAT METERS

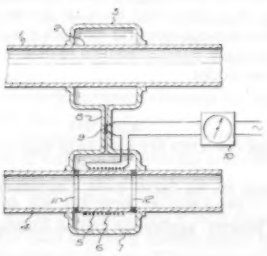
Roger Fell, 5 Egremont Road, Milnrow, Lancaster, and Brian Clifton, 39 Beech House, The Beeches Manchester, Lancaster, both of England

Filed Oct. 3, 1975, Ser. No. 619,182

Claims priority, application United Kingdom, Oct. 8, 1974, 43553/74

Int. Cl.² G01K *17/10*

U.S. Cl. 73—193 R **1 Claim**



1. Heat metering apparatus for measuring heat loss or gain in a confined heat transporting medium flowing in a system having spaced conduits, heat sensitive means for monitoring the temperature of the medium passing through one of said conduits, a thermally conductive section in the other conduit in

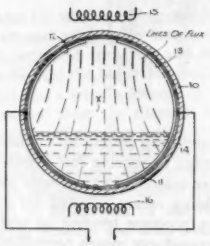
thermal contact with the medium passing therethrough, means thermally insulating said thermally conductive section from the remainder of said other conduit, means for heating said thermally conductive conduit section, heat sensitive means for monitoring the temperature of said thermally conductive section, and measuring and control means interconnecting said heat sensitive means for detecting measured temperature differences between them and for energizing said heating means for minimizing said differences and measuring the energy so supplied, said heat sensitive means comprising gas filled bulbs associated with the respective conduits and interconnected by a capillary tube containing a switch to form a differential thermometer, and said measuring and control means including a power supply and power input indicator in circuit with said heating means and said switch.

4,036,052

ELECTROMAGNETIC FLOWMETER USABLE IN LESS-THAN-FULL FLUID LINES

John L. Searle, Richboro, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed July 30, 1976, Ser. No. 710,118
Int. Cl.[2] G01F *1/58*
U.S. Cl. 73—194 EM **7 Claims**



1. An electromagnetic flowmeter for accurately measuring the flow rate of fluid in a fluid line which is normally less-than-full, said flowmeter comprising:

A. a flow tube interposable in said line and provided with a pair of arcuate electrodes in direct contact with said fluid and spanning a substantial portion of the total circumference of the tube to render the electrodes operative with respect to the fluid passing through the tube in a fluid level range whose lowest point is a level close to empty, each electrode having a shape whose total area includes a substantial portion which is disposed adjacent to the bottom of the tube and is therefore always in contact with the fluid passing therethrough regardless of fluid level, whereby the percentage change in the total electrode area due to changes in fluid level are minimized; and

B. electromagnetic means to establish a magnetic field in said tube which is intercepted by said fluid to induce a signal in said electrodes.

4,036,053

METHODS OF AND MEANS FOR MEASURING LIQUID FLOW

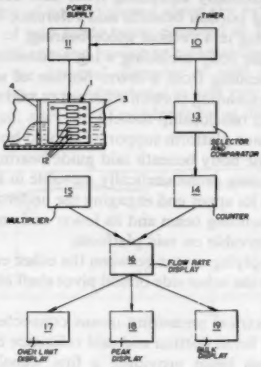
Roy Jenkins, 86, All Saints Road, Cheltenham, England

Filed Feb. 27, 1976, Ser. No. 661,993
Claims priority, application United Kingdom, Feb. 28, 1975, 8378/75
Int. Cl.[2] G01F *1/68, 23/00*
U.S. Cl. 73—204 **6 Claims**

1. A flowmeter comprising an immersible sensing element and measuring means connected thereto, said sensing element having a plurality of temperature-sensitive circuit components in spaced array for disposition in a conduit or weir so as to be immersed and cooled to an extent dependent on the depth of liquid in the conduit or weir, said measuring means including:

a. a timer which completes a heating circuit for the temperature-sensitive elements for a selected period at selected intervals,

b. a comparator connected to the temperature-sensitive



components for differentiating between the components of one temperature state and the components of another temperature state,

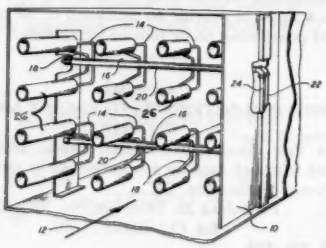
c. a counter responsive to the comparator for recording the number of components of one of said temperature states to indicate the depth of immersion of the sensing element and hence the flow rate.

4,036,054

FLUID PRESSURE SENSING APPARATUS

Roger T. Goulet, Liverpool, N.Y., assignor to Cambridge Filter Corporation, Syracuse, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,234
Int. Cl.[2] G01F *1/46*
U.S. Cl. 73—212 **12 Claims**



1. Apparatus for measuring pressure in an enclosed duct through which a fluid is flowing in a known direction, said apparatus comprising in combination:

a. a plurality of hollow total pressure sensing tubes fixedly supported within the duct and having open ends directed oppositely to the direction of fluid flow;

b. a plurality of hollow air flow straighten tubes open at both ends and supported within the duct and extending longitudinally along the axis thereof; and

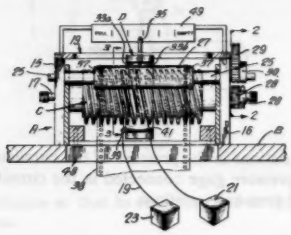
c. each of said sensing tubes being arranged with said open ends thereof positioned within one of said straightener tubes, the length of said straightener tubes in the upstream direction from said open end of the associated total pressure sensing tube being equal to at least approximately eight times the largest internal lateral dimension of said straightener tubes.

4,036,055

LIQUID LEVEL MEASURING APPARATUS

Bernard H. Engelhardt, Dollard des Ormeaux, and Marcus Mintz, Chomedey, both of Canada, assignors to Bernard J. Engelhardt, Canada

Filed June 3, 1976, Ser. No. 692,379
Int. Cl.[2] G01F *23/08*
U.S. Cl. 73—312 8 Claims



1. A liquid level measuring and recording apparatus comprising;

a record inscribing means and a record retaining means, one of said inscribing means or retaining means being adapted to be rotatably driven relative to said other means, said one means comprising rotating means, said rotating means being rotatable in one direction only;

float means in said liquid adapted to follow the change of level of said liquid level;

first means connecting said float means to said rotatable means said rotatable means being driven when said liquid level is changing in one way, said rotatable means being non-rotatably disposed when said liquid level is changing in the other way;

said first means further connecting said float means to said record inscribing means to move said record inscribing means in a straight line along one direction on said record retaining means when said liquid level is changing is said one way, and for moving said record inscribing means in an opposed direction on said record retaining means when said liquid level is changing in said other way;

whereby,

when said liquid level changes in said other way, a straight line will be inscribed in the one direction on said record retaining means by the motion of record inscribing means on said record retaining means; and

when said liquid level is changing in the one way, a straight line will be inscribed at an angle to said one direction and in the other direction on said record retaining means by the motion of said record inscribing means on said record retaining means.

4,036,056

SINGLE-SLIDE PRESS FOR CARRYING OUT MULTIPLE FUNCTIONS WITH A SINGLE WORK-INPUT STROKE

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 659,994
Int. Cl.[2] B21D *31/02*
U.S. Cl. 72—329 8 Claims

1. Apparatus for use in the manufacture of a cup-shaped can body from flat rolled sheet metal, which manufacture embodies multiple step operations carried out at differing force requirements including at least the steps of cutting a sheet metal blank, clamping the sheet metal blank for drawing, and drawing the sheet metal blank into a cup-shaped can body, comprising

press means having single slide characteristics capable of carrying out such multiple step operations with a single work-input stroke,

such press means including:

frame means defining a longitudinal axis of symmetry for the press means,

fixed bed means, and

a single, work-input, movable slide means,

such slide means being movable toward the fixed bed means in a direction parallel to the longitudinal axis of symmetry,

the fixed bed means including:

a work table surface for supporting flat rolled sheet metal from which a blank is to be cut, such work table surface lying in a plane perpendicular to the longitudinal axis of symmetry,

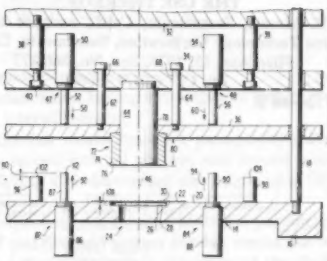
female cutting edge means for cutting a blank from flat rolled sheet metal supported on the work table means,

female drawing die means defining at least one female drawing die opening having a longitudinal axis parallel to the axis of symmetry of the press means and circumscribed by the female cutting edge means,

female clamping surface means for a cut sheet metal blank, located intermediate the female die opening and the female cutting edge means, such clamping surface means lying in a plane perpendicular to the axis of symmetry of the press means, and

counterforce means located to exert force in a direction parallel to such axis of symmetry and opposite to the direction of movement of such slide means toward the fixed bed means;

the single, work-input, movable slide means being subdivided into interrelated substructures including:



a draw punch support plate mounted for movement with such slide means and extending laterally in generally perpendicular relationship to the axis of symmetry of the press,

a clamping plate in longitudinally spaced relationship from the support plate and extending laterally in generally perpendicular relationship to the axis of symmetry,

the clamping plate being mounted for movement with such slide means and for relative longitudinal movement with respect to such support plate, and

male draw punch means mounted on the support plate for movement parallel to the longitudinal axis of the press means, such male draw punch means comprising at least one male plunger,

the clamping plate defining aperture means for longitudinal passage of such male plunger,

male cutting and clamping structure mounted on the clamping plate means to extend longitudinally in the direction of the female cutting and clamping means,

the male cutting and clamping structure including male cutting edge means circumscribing a male clamping surface means, the male clamping surface means lying on a plane perpendicular to the axis of symmetry of the press means and being in circumscribing relationship to the male plunger,

force modifying means connected to such support plate and extending longitudinally toward and contacting the clamping plate to modify the force exerted by the male cutting and clamping structure supported on the clamping

plate, such force modifying means exerting a selected force in parallel ralationship to the axis of symmetry, the selected force having a direction which is the same as the direction of movement of the slide means toward the fixed bed means,

such male plunger, support plate with force modifying means, and the clamping plate with male cutting and clamping structure being movable longitudinally toward the work table means with the male cutting edge means and clamping surface means positioned to contact flat rolled sheet metal supported on the work table surface and, after cutting of a sheet metal blank with a selected force, clamp the sheet metal blank with a force less than such selected cutting force as the clamping plate contacts the counterforce means of the fixed bed means,

the counterforce means permitting longitudinal movement of the clamping plate and the male clamping surface means in the direction of movement of the slide means toward the fixed bed means at such reduced force,

means for limiting longitudinal movement of the clamping plate to a pre-selected distance related to the thickness gage of such sheet metal blank, with

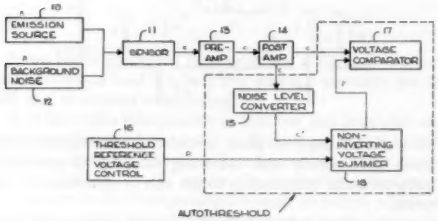
such male plunger being movable longitudinally into and through the female drawing die opening with ejection of the drawn cup-shaped can body being in the direction of movement of such slide means toward the fixed bed means.

4,036,057

AUTOMATIC THRESHOLD CONTROL MEANS AND THE USE THEREOF

Carroll F. Morais, Sacramento, Calif., assignor to Acoustic Emission Technology Corporation, Sacramento, Calif.

Filed Apr. 15, 1975, Ser. No. 568,277
Int. Cl.[2] G01N 3/00
U.S. Cl. 73—88 R **15 Claims**



1. An acoustic emission apparatus for the detection and/or location of structural flaws comprising sensor means, and means for receiving signals emitted from said sensor means and for determining the location of flaws in the workpiece being monitored, the improvement comprising an automatically variable threshold voltage level control means connected to said means for receiving signals from said sensor means.

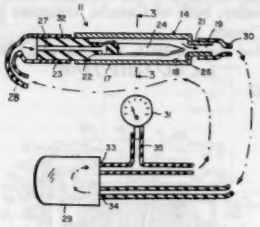
4,036,058

HOT SPOT THERMOMETER

John R. Bodker, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,995
Int. Cl.[2] G01K 1/08, 5/48
U.S. Cl. 73—350 **5 Claims**

1. The combination comprising an electrical transformer apparatus having a tank containing cooling fluid in which the coils of a transformer winding are immersed, a thermometer unit having a hollow-ended body of ceramic dielectric material inserted into a space between the coils, the body being connected in a closed circuit filled with gas, a pump connected in the circuit for circulating the gas about the circuit, a heat sensing element of dielectric material arranged in the hollow of the body expanding and contracting in response to temperature changes developing in the transformer winding to cause corresponding variations in the pressure of the circulating gas, and a sight gas pressure gage connected in the circuit adapted to indicate said pressure variations.



4,036,059

THERMAL SYSTEM

Thomas Charles Cliff, St. Austell, England, assignor to United Gas Industries Limited, London, England

Filed Jan. 20, 1976, Ser. No. 650,615
Claims priority, application United Kingdom, Feb. 14, 1975, 6309/75
Int. Cl.[2] G01K 5/10
U.S. Cl. 73—368 **5 Claims**

1. A thermal system of the kind comprising a phial for containing mercury and a capillary tube leading from the phial, said system being formed in two parts, one part including the phial and a length of the capillary tube being formed of substantially nickel-free steel and the other part comprising the rest of the capillary tube being formed of stainless steel, the two parts being sealed to one another at a joint made at a point along the length of the capillary tube where it is exposed to a temperature at which the liability to corrosive attack by the mercury is reduced to an acceptable level.

4,036,060

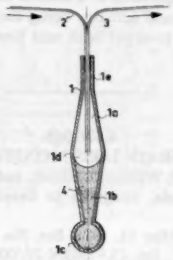
TEMPERATURE MEASURING PROCESS AND PROBE

Alain Deficis, Toulouse - Cedex, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 10, 1976, Ser. No. 713,260
Claims priority, application France, Aug. 13, 1975, 75.25462
Int. Cl.[2] G01K 5/02
U.S. Cl. 73—368 **14 Claims**

3. A thermometric probe comprising a closed capillary enclosure internally limited by a revolution surface the directrix of which has a predetermined shape, a liquid which expands under the action of heat contained inside said enclosure so as to form a meniscus inside same, a first optical conductor to bring a beam of light from a source and which penetrates inside the enclosure so that its emitting end is disposed facing

the meniscus, and a second optical conductor to return the reflected light to light analysis means and which penetrates



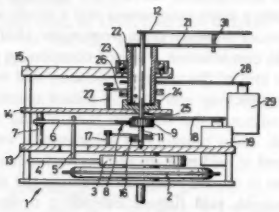
into the enclosure so that its receiving end is disposed facing said meniscus.

4,036,061

BLOOD PRESSURE INDICATOR GAUGE

Blasius Speidel, Hochmeisterstrasse 244, 7453 Jungingen, Germany

Filed June 17, 1975, Ser. No. 587,641
Int. Cl.[2] A61B 5/02
U.S. Cl. 73—410 **21 Claims**



1. A blood pressure indicator gauge designed for the measurement and the temporary recording of the systolic and/or the diastolic blood pressure of a patient as a component part of a blood pressure measuring apparatus which includes means for generating first and second electrical electrical signals at the instances at which said systolic and diastolic pressures are established, respectively, inside a measuring sleeve of the apparatus, the indicator gauge comprising in combination:

a gauge housing;

a pointer shaft rotatably journalled in the housing and carrying a pointer attached to one of its extremities;

a return spring connected to the pointer shaft so as to rotationally bias the latter in the direction of a return movement;

a pressure capsule adapted for pressure communication with the measuring sleeve of the apparatus and including mechanical capsule movement translating means which operatively engage the pointer shaft so as to angularly advance the latter in a pushing action in opposition to the rotational return movement bias of the return spring, when the capsule expands in response to a pressure increase; and

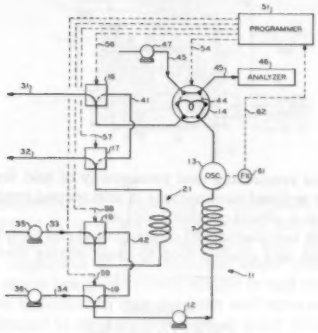
means for blocking a spring-driven pointer return movement in any pointer position within an angular pressure measurement range, in response to the reception from the apparatus of one of said electrical signals; said pointer blocking means comprising; a first blocking member mounted on the pointer shaft, at a distance from said pointer, for rotation therewith, said blocking member having a generally flat planar surface; a non-rotatable second blocking member supported by the housing so as to be normally positioned a minimal distance from the first blocking member in all positions of the latter within said pressure measurement range; said first and second blocking members being engageable against each other, in response to said one electrical signal, thereby arresting the first blocking member and the shaft and pointer to which member is attached.

4,036,062

SAMPLE DILUTION

Charles G. Cruzan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1976, Ser. No. 719,216
Int. Cl.[2] G01N 1/10
U.S. Cl. 73—422 GC **18 Claims**



1. Apparatus comprising:

first conduit means having a passageway therethrough with a first internal volume;

second conduit means having a passageway therethrough with a second internal volume, said second internal volume having a predetermined size relationship to said first volume;

fluid oscillator means, forming at least a portion of at least one of said first and second conduit means, for imparting flow oscillation to at least a portion of the fluid passing therethrough;

means for filling said passageway of said first conduit means with a diluent liquid;

means for filling said passageway of said second conduit means with a sample material;

means for connecting said passageway to said first conduit means and said passageway of said conduit means to form a closed conduit loop; and

means for circulating said diluent liquid and sample material through said conduit loop to cause mixing thereof.

4,036,063

SAMPLE DILUTION

Lewis B. Roof, and Grady T. Porter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1976, Ser. No. 719,215
Int. Cl.[2] G01N 1/10
U.S. Cl. 73—422 GC **16 Claims**

1. Apparatus comprising:

first conduit means having a passageway therethrough with a first internal volume;

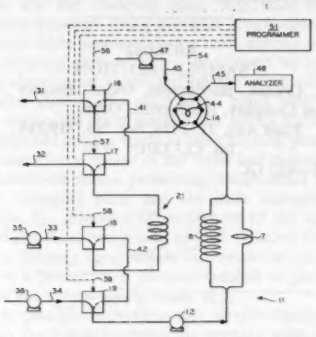
second conduit means having a passageway therethrough with a second internal volume, said second internal volume having a predetermined size relationship to said first internal volume;

parallel flow passageway means forming at least a portion of at least one of said first and second conduit means for providing at least two parallel passageways having differ-

ent flow transmission time characteristics through at least a portion of the associated conduit means;

means for filling said passageway of said first conduit means with a diluent liquid;

means for filling said passageway of said second conduit means with a sample material;



means for connecting said passageway of said first conduit means and said paassageway of said second conduit means to form a closed conduit loop; and

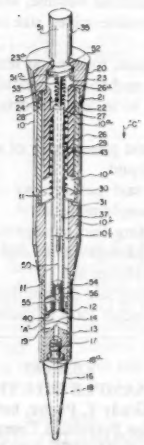
means for circulating said diluent liquid and sample material through said conduit loop to cause mixing thereof.

4,036,064

PIPETTE DEVICE

Steven J. Hydo, Wellington, Ohio, assignor to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Filed Sept. 11, 1975. Ser. No. 612,351
Int. Cl.[2] B01L *3/02*
U.S. Cl. 73—425.6 **33 Claims**



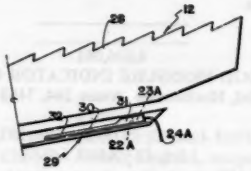
1. A pipette device for providing analysis of single samples of liquids comprising an elongated body having a chamber for holding liquids therein, a probe tip on one end of said body and having a passageway defining the inlet and outlet for said chamber, a primary plunger assembly movable disposed in said chamber and actuatable to aspirate and expel liquids from said chamber, said primary plunger assembly being actuatable in a first direction into said chamber to define zero chamber volume and actuatable in a second direction to aspirate a predetermined volume of a first liquid material into said passageway of said probe tip and into said chamber to substantially fill said chamber, a second plunger assembly disposed within said body and actuatable in said first direction to expel a predetermined portion of said first liquid material from said chamber, said second plunger assembly being actuatable in said second direction to effect the aspiration of a second liquid into the inlet of said chamber, and said actuator being thereafter actuatable in said first direction to expel both said first and second liquids from said chamber.

4,036,065

GRAIN LOSS MONITOR

William P. Strelioff; William S. Elliott, and Dale Johnson, all of Saskatoon, Canada, assignors to Senstek Ltd., Saskatoon, Canada

Filed May 11, 1976, Ser. No. 685,282
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—432 R **11 Claims**



1. A grain loss monitor device for combines and the like which includes a sieve component and a straw walker assembly for separating threshed grain from straw, chaff and the like; comprising in combination a sensor component situated adjacent the rear end of the sieve component, said sensor component including pick-up and support means spanning said sieve component adjacent the rear end thereof and spaced above said rear end, and a plurality of substantially vertical sensing fingers secured to said pick-up and support means and depending therefrom in spaced relationship across the rear end of the sieve component, said fingers extending downwardly from said pick-up and support means to adjacent the rear end of said sieve component whereby a constant percentage of grain passing over said sieve component impinges upon said fingers, electrical transducer means in said pick-up and support means responsive to said impingement of grain, electrical amplifying means operatively connected to said transducer means and detector means operatively connected to said amplifying means, said detector means detecting a range of amplitudes of voltage spikes above a pre-determined amplitude, the range of amplitudes including voltage spikes developed from said grain impingement, a pulse generating circuit connected to the amplitude detecting circuit and responsive to the detected voltage spikes to generate square wave pulses and a measuring circuit connected to said pulse generating circuit.

4,036,066

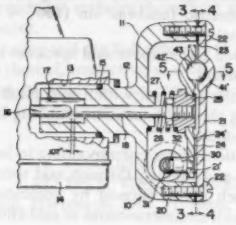
TRANSMISSION MODULATOR VALVE CONTROL

Richard D. Houk, Stow, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Apr. 21, 1976, Ser. No. 678,726
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—55 **17 Claims**

1. An actuator for applying linear force to the push pin of an automatic transmission modulator valve to automatically change shift speeds in direct proportion to engine load demands, comprising interfacing rotary and stationary cam plates having circumferentially arranged opposed complementary cam surfaces, anti-friction elements between and contacting said surfaces, and means operatively connecting said rotary

cam plate to the engine throttle for applying rotary force to said rotary plate, said rotary plate transmitting an increased



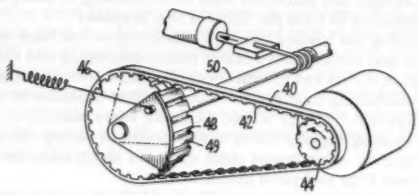
value of said force linearly to said push pin in direct proportion to the travel of the throttle.

4,036,067

INTEGRAL REVOLUTION CLUTCH

Alexander D. R. Walker, Mt. View, Calif., assignor to N-Dimensions, Inc., Cupertino, Calif.

Filed Sept. 8, 1975, Ser. No. 611,125
Int. Cl.² F16H *27/00*
U.S. Cl. 74—112 **6 Claims**



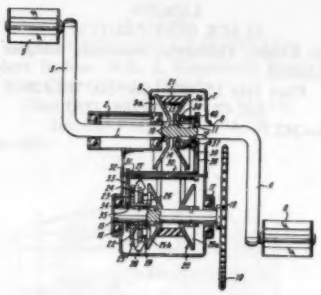
1. An integral revolution clutch comprising:
a continuously rotatable drive pulley;
a driven shaft;
a secondary pulley mounted for free rotation about the axis of the driven shaft;
belt means engaging both said drive pulley and said secondary pulley to rotate said secondary pulley continuously said belt means engaging only a portion of the driving face of said secondary pulley;
a segment member aligned with a portion of the driving face of said secondary pulley, said member having an arcuate length of less than 180°, said segment member being fixed to said driven shaft and normally lying over only that portion of the driving face of said secondary pulley not engaged by said belt means;
stop means normally preventing rotation of said driven shaft;
bias means urging said driven shaft against said stop means, in the direction of rotation of the secondary pulley;
stop release means for releasing said stop means whereby said bias means urge said segment member into engagement with said belt, causing said belt to rotate said segment and said driven shaft;
and stop restoration means for restoring said stop means to interrupt rotation of said segment member and said driven shaft after an integral number of revolutions.

4,036,068

ENCAPSULATED TRANSMISSION UNIT

Robert B. Gilbert, 443 Hazelhurst St., New Lebanon, Ohio 45345

Division of Ser. No. 346,625, March 30, 1973, Pat. No. 3,948,112. This application Jan. 20, 1976, Ser. No. 650,797
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 E **18 Claims**



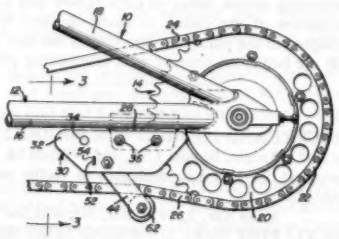
1. A transmission unit comprising an input shaft, an output shaft, adjustable drive means through which said input shaft drives said output shaft, means associated with one of said shafts and responsive to the rotational speed thereof, said responsive means being operatively related to said drive means to adjust the transmission ratio between said input and output shafts in response to changes in rotational speed of said one of said shafts, a housing for said apparatus and means connecting said output shaft in a driving relation to said housing.

4,036,069

MOTORCYCLE CHAIN GUIDE AND TENSIONER

Dwaine H. Clark, 8421-23 Rosemead Blvd., Pico Rivera, Calif. 90660

Filed Apr. 13, 1976, Ser. No. 676,547
Int. Cl.² G01F *3/14*
U.S. Cl. 74—242.1 TA **10 Claims**



1. A chain tensioner and guide assembly for a motorcycle and in particular for a motorcycle of the type including swing arm suspension for the rear wheel of the motorcycle, said assembly including a single upstanding mounting plate having a generally horizontal upper marginal edge portion, said upper marginal portion including means adapting said plate for rigid support from a depending mount flange extending along an associated swing arm with upper marginal portion lapped over at least the lower marginal portion of said mount flange, an elongated pivot shaft having one end portion thereof removably rigidly secrued through said plate with the other end portion of said pivot shaft projecting laterally outwardly of said plate, a pair of parallel arms having a first pair of corresponding ends mounted on said other end portion of said pivot shaft at points spaced therealong, said plate including a lower

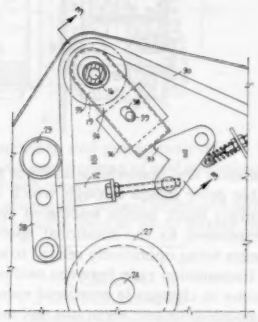
marginal edge portion, the other pair of corresponding ends of said arms projecting downwardly below said lower marginal edge portion and having axle means extending and connected therebetween, a roller journaled on said axil means between said other pair of arm ends and spring means operatively connected between said plate and one of said arms for yieldingly biasing said arms in one direction of angular displacement about said pivot shaft relative to said plate.

4,036,070

SLACK BELT CLUTCH

Roy George Knight, Thebarton, Australia, assignor to Scott Bonnar Limited

Filed July 15, 1976, Ser. No. 705,625
Int. Cl.[2] F16H *7/08, 7/10*
U.S. Cl. 74—242.7 **7 Claims**



1. A slack belt clutch wherein a belt extends between a driving and a driven pulley, and clutch actuating means operatively engage the belt or at least one of said pulleys, the clutch actuating means being operable either to tighten the belt to engage said pulleys with sufficient belt tension to engage drive therebetween, or alternatively to loosen the belt so that the belt disengages said drive,

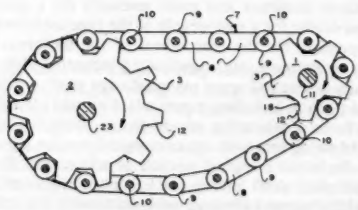
comprising a belt lift device engageable against the belt, and coupling means coupling the belt lift device to the clutch actuating means, being so constructed and arranged that actuation of the clutch to cause the belt to be loosely coupled to the pulleys in turn causes the belt lift device to lift the belt from contact with the driving pulley.

4,036,071

SPROCKET AND METHOD FOR PRODUCING SAME

Oliver R. McKnight, Bossier City, and William M. Seaman, Jr., Shreveport, both of La., assignors to Hollis and Company, Caddo, La.

Filed Apr. 2, 1976, Ser. No. 673,284
Int. Cl.[2] F16H *55/30, 55/06;* **B21D** *53/26;* **B21K** *1/28*
U.S. Cl. 74—243 R **5 Claims**



1. A method of producing a template profile for a sprocket comprising:

a. selecting a sprocket face width, number of sprocket teeth, chain pitch and chain barrel diameter for a selected sprocket application;

b. laying out the sprocket center;

c. calculating a pitch diameter by dividing said chain pitch by the trigonometric function: sin (180° ÷ number of sprocket teeth selected);

d. inscribing a pitch circle about said sprocket center using said pitch diameter;

e. forming a regular polygon within said pitch circle, said polygon having chordal lines corresponding to the length of said chain pitch;

f. laying out additional lines corresponding in length to said pitch diameter and running through said sprocket center connecting pitch points formed by coincidence of said chordal lines with the intersections of said chordal lines of said regular polygon;

g. laying out first reference lines through said pitch points perpendicular to said additional lines connecting said pitch points and tangent to said pitch circle at said pitch points;

h. calculation of a loading curve angle by adding: 40° + (60° ÷ said number of sprocket teeth selected);

i. laying out second reference lines through said pitch points along said first reference lines and rotated from said first reference lines through said loading curve angle at said pitch points;

j. establishing loading curve center point distances from said pitch points along said second reference lines by multiplying 0.9 × (said chain barrel diameter + 0.18);

k. laying out loading curve center points by measuring said loading curve center point distance along said second reference lines from said pitch points;

l. calculating clearance curve radii by adding 0.18 to said chain barrel diameter and dividing by 2;

m. laying out clearance curves from said clearance curve radii by inscribing an arc from each of said pitch points through said additional lines corresponding to said pitch diameter to form the fillets of said template;

n. laying out loading curves by inscribing an arc from each of said loading curve center points, continuing said clearance curves to form the tooth shoulders of said template;

o. calculating topping curve center point distances by the formula: 1.2 × (2 × said clearance curve radius);

p. locating topping curve center points by laying off said topping curve center point distances along said chordal lines from said pitch points; and

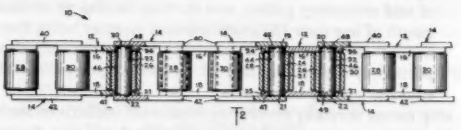
q. laying out topping curves from said topping curve center points by extending said loading curves on each of said shoulders of said template until said topping curves meet.

4,036,072

WELDED STEEL ROLLER CHAIN

John F. McKeon, Carmel, Ind., and Roy E. Lambert, Englewood, Fla., assignors to FMC Corporation, San Jose, Calif.

Filed June 12, 1975, Ser. No. 586,472
Int. Cl.[2] F16G *13/02, 13/06*
U.S. Cl. 74—245 R **4 Claims**



1. In a roller chain having alternately interconnected roller links and pin links, said roller links being provided with axially bored bushings extending between roller link side bars,

each said pin link having a pair of laterally spaced imperforate side bars extending longitudinally of the chain on opposite sides, said side bars having inside and outside faces, with said inside faces lying adjacent the ends of said roller link side bars,

a pair of pins extending transversely of the chain between said pin link side bars with each said pin extending through a pair of roller link side bars and a respective roller link bushing, said pins being substantially cylindrical with curved side surfaces therealong and at the end portions thereof,

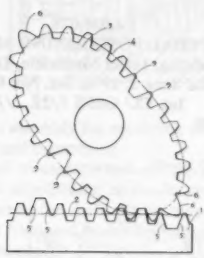
and welds fusing said pin link side bars to said pins at the end portions thereof, respectively, with said pin link side bars being free of welds on the outside faces thereof remote from said roller link ends.

4,036,073

ELLIPTIC GEAR WHEEL

Akitoshi Kitano, Horinouchi 1403, Hayama, Miura, Kanagawa, Japan

Filed Dec. 10, 1975, Ser. No. 639,455
Claims priority, application Japan, Dec. 10, 1974, 49-141673
Int. Cl.² F16H *35/02, 1/04, 55/04, 55/06*
U.S. Cl. 74—393 **13 Claims**



1. In a flow meter, driving pump or the like, the combination of a first gear rotor and a second gear rotor, both mounted for rotation about their centers operatively positioned with their teeth in mesh for all angular positions of each of said gears, in which one of said rotors has a pitch circle defined by a curve obtained so that at the polar coordinates, when a, b and c represent numbers relating to the length, d represents a positive number from zero to 1 and x represents an independent variable, and the length of a radius vector ρ_1 is obtained by the following formula:

$$\rho_1 = a + \cos 2x\left(\frac{c \cdot d^2 |\sin^2 2x|}{(1 - d^2\cos^2 2x)^2} - b\right) \quad (1)$$

and assuming that μ represents the number determined by a, b, c, and d, then the directional angle θ_1 of the vector ρ_1 is obtained by the following formula:

$$\theta_1 = \frac{1}{\mu}\int \frac{dx}{\rho_1} \quad (2)$$

and the other rotor has a pitch circle engaging said first-mentioned pitch circle and defined by a second curve so obtained that at the polar coordinates, the length of a radius vector ρ_2 is obtained by the following formula:

$$\rho_2 = a - \cos 2x\left(\frac{c \cdot d^2 |\sin^2 2x|}{(1 - d^2\cos^2 2x)^2} - b\right) \quad (3)$$

and the direction angle

-continued

$$\theta_2 = \frac{1}{\mu}\int \frac{dx}{2} \quad (4)$$

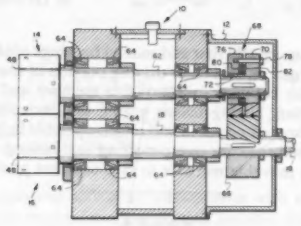
and the tooth form on the longer and shorter radius portions of each of said pitch circles having a greater tool pressure angle than that of the tooth form on the intermediary portion between said longer and shorter radius portions along the pitch circle.

4,036,074

ANTI-BACKLASH GEAR SYSTEM

Ernest Robert Bodnar, R.R. 1, Kingsworth Road, Kingcross Estates, King City, Ontario, Canada

Filed Oct. 1, 1975, Ser. No. 618,630
Int. Cl.² F16H *55/18, 35/08*
U.S. Cl. 74—409 **3 Claims**



1. An anti-backlash gear system for use between a drive shaft and a driven shaft and wherein one said shaft is provided with a gear having helical teeth thereon, said anti-backlash system comprising;

a gear portion fixed to the other said shaft, and having helical teeth meshing with said helical gear, said gear portion having a width less than the width of said helical gear;

a movable gear portion, slidably mounted on said shaft, and being slidable therealong from a spaced apart initial position towards said fixed gear portion into backlash take up relation, said movable gear portion having a width less than that of said helical gear, and having helical teeth meshing therewith;

spring means engaging said movable gear portion, and urging the same normally away from said fixed gear portion, and,

adjustable means for moving said movable gear portion towards said fixed gear portion, against the pressure of said spring into said backlash take up relation thereto.

4,036,075

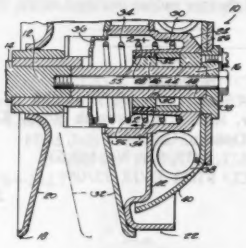
VARIABLE SPEED POWER TRANSMISSION INCLUDING MEANS FOR MINIMIZING BACKLASH

George G. Lassanske, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 5, 1976, Ser. No. 683,625
Int. Cl.² F16H *55/18*
U.S. Cl. 74—409 **9 Claims**

1. A power transmission comprising a shaft adapted for connection to a power source and having a driving portion, a fixed member affixed on said shaft and having a flange, a movable member having a flange and a hub having a bore, drive means carried by said hub bore mounting said movable member on said shaft driving portion with said flanges of said fixed and movable members in facing relationship for common rotation of said movable member with said shaft and for axial movement of said movable member on said shaft between a position spaced from said fixed member to provide a neutral drive condition and a position adjacent said fixed member to provide a power transmitting condition, said drive means comprising axially spaced first and second bushings each hav-

ing a central aperture which receives said shaft driving portion and has driven surfaces which are drivingly engaged by said shaft driving portion during rotation of said shaft by said power source, said first bushing being affixed to said hub bore, and means for resiliently urging said second bushing rotationally relative to said first bushing, whereby portions of said



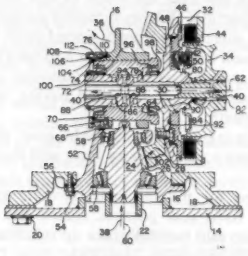
driven surfaces of said first and second bushings apply a predetermined torque on said shaft driving portion to thereby minimize backlash between said movable member and said shaft driving portion, biasing means urging said movable member toward said spaced position, and means operable in response to rotation of said shaft for overpowering said biasing means and moving said movable member to said adjacent position.

4,036,076

GEAR ADJUSTING, LOCKING, AND PRE-LOADING MEANS

John C. Anderson, Brookfield, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 25, 1976, Ser. No. 661,239
Int. Cl.[2] F16H 55/18, 1/14
U.S. Cl. 74—409 **10 Claims**



1. A relatively axially slideable pair of relatively non-rotatable members disposed one within another having:

first locking means comprising a thrust washer and engaging both members with opposite force tending to create axial slide motion; and

second adjusting means comprising a nut engaging both members and pre-loaded to prevent slide motion.

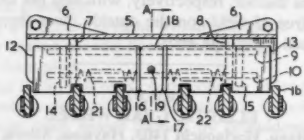
4,036,077

SAFETY DEVICE FOR LOCKING A PLURALITY OF OPERATION LEVERS

Takayuki Akiyama, Sagamihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1976, Ser. No. 655,952
Claims priority, application Japan, Mar. 13, 1975, 50-30456
Int. Cl.[2] G05G 5/00
U.S. Cl. 74—526 **8 Claims**

1. A safety device for locking a plurality of operation levers, the device comprising a frame on which the levers are mounted for pivotal movement with respect thereto, two lock plates mounted side by side on the frame for movement towards and away from one another between locked and unlocked positions of the device in response to rotary movement of a cam disposed therebetween; a respective link pivoted to each of the levers having its free end supported for linear



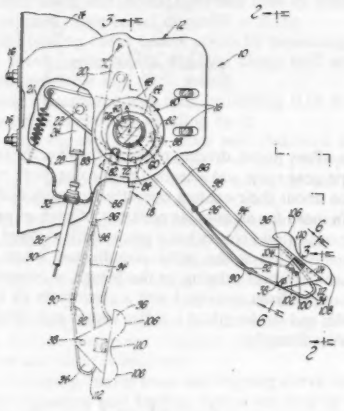
reciprocal movement in response to the pivotal movement of the respective lever, the link having an engaging portion which co-operates with an engaging portion on the respective lock plate on movement of the lock plate towards the locked position to lock the link against the said reciprocal movement.

4,036,078

BRAKE PEDAL POSITIONING MECHANISM

Anthony A. Muehling, 14583 Maddelein, Detroit, Mich. 48205

Filed June 3, 1976, Ser. No. 692,418
Int. Cl.[2] G05G 5/22, 1/16
U.S. Cl. 74—529 **15 Claims**



1. A vehicle parking brake pedal positioning mechanism comprising: a frame adapted for mounting on a vehicle body; a parking brake pedal mounted on the frame for movement about a pivotal axis between a released position and an actuated condition; said frame including a first cam surfece extending about the pivotal axis and including a portion having increasing radii therefrom moving in a direction corresponding to the direction of brake pedal movement from the released position to the actuated condition; a locking member mounted on the frame for pivotal movement about the pivotal axis and including a second cam surface having a portion with increasing radii from the pivotal axis in the same direction as the first cam surface portion; a slide mounted for pivotal movement with the brake pedal and for sliding movement relative thereto; said slide including first and second opposite ends respectively engaged in a slidable manner with the first and second cam surface portion such that movement of the pedal from the released position to the actuated condition pivotally moves the slide into a locking relationship between the cam surface portions and thereby positions the pedal in the actuated condition in an infinite position manner against movement toward the released position; spring means for normally biasing the locking member about the pivotal axis to maintain an engaged condition between the second end of the slide and the second

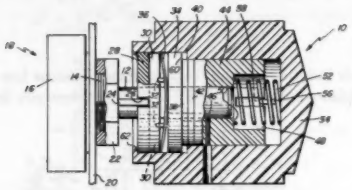
cam surface portion on the locking member; and release means for selectively pivoting the locking member about the pivotal axis in a direction opposite to the normal bias of the spring means so as to permit the pedal to move to the released position.

4,036,079

BRAKE LOCK KNOB ASSEMBLY

Albert R. Pratt, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 3, 1976, Ser. No. 682,436
Int. Cl.[2] G05G *5/06, 1/10*
U.S. Cl. 74—531 **10 Claims**



1. A control knob assembly for mounting on an end portion of a rotatable shaft and comprising:

a bushing disposed to encircle the end portion of the shaft and having first interlocking means for transmitting rotational movement to the shaft, the bushing also being provided with first frictional means for preventing rotational movement of the shaft;

a nonrotatable member disposed adjacent the bushing and having second frictional means disposed to releasably engage the first frictional means for locking the shaft in a preselected angular position;

a cup-shaped knob shell coaxially disposed with respect to the bushing, the shell having releasing means for disengaging the frictional means and having second interlocking means for transmitting rotational movement to the shaft; and

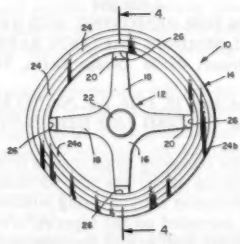
spring means disposed between the bushing and the shell for resiliently positioning the shell in predetermined relationship with the bushing.

4,036,080

MULTI-RIM FLYWHEEL

Johan A. Friedericy, Palos Verdes Estates, and Dennis A. Towgood, Huntington Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 29, 1974, Ser. No. 528,388
Int. Cl.[2] F16F *15/30;* **F16C** *15/00;* **H02K** *7/02*
U.S. Cl. 74—572 **27 Claims**



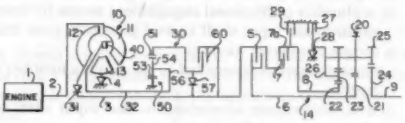
3. A flywheel comprising hub means having a plurality of spokes, and a plurality of nested rims positioned on said spokes, said rims having a noncircular configuration when said flywheel is at rest and having a substantially circular configuration when said flywheel is spinning at a preselected speed.

4,036,081

OVERDRIVE MECHANISM FOR AUTOMOTIVE POWER TRANSMISSION

Kiyoshi Onuma, and Syuji Nagano, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 25, 1975, Ser. No. 590,130
Claims priority, application Japan, Mar. 6, 1975, 50-26544
Int. Cl.[2] F16H *3/04, 47/08, 57/10*
U.S. Cl. 74—781 R **6 Claims**



1. An improved automatic transmission with an overdrive device for an engine having a driving member comprising:

a. a change gear mechanism having:
   i. an input shaft,
   ii. a planetary gear train, and
   iii. a plurality of frictional engagement means for interconnecting said input shaft to said planetary gear train;

b. a torque converter having:
   i. a pump impeller connected to the driving member of the engine,
   ii. a turbine runner connected to said input shaft of said change gear mechanism,
   iii. a stator located between said pump impeller and said turbine runner, and
   iv. a converter housing for enclosing said pump impeller, said turbine runner, and said stator in fluid flow relationship therein;

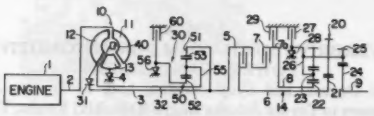
c. an overdrive device positioned outside of said converter housing between said torque converter and said change gear mechanism, said device having:
   i. an overdrive gear train including a sun gear affixed to the housing of said automatic transmission, a carrier responsive to said pump impeller, a ring gear, and a pinion rotatably supported by said carrier and engaging said ring gear and said sun gear, said ring gear thereby being responsive to said pump impeller and rotating at a higher speed than said pump impeller,
   ii. overdrive clutch means connected to said input shaft of said change gear mechanism outside of said converter housing and activated in response to the operation of said change gear mechanism for engaging said ring gear whereby said input shaft of said change gear mechanism rotates with said ring gear in response to movement of said pump impeller, and
   iii. an intermediate shaft rotatably and co-axially disposed around said input shaft of said change gear mechanism having a first end connected to said pump impeller in said converter housing and a second end extending out of said converter housing and connected to said carrier; and

e. a one-way clutch connecting said turbine runner to said input shaft, said one-way clutch decoupling said shaft from said turbine runner when the speed of said input shaft exceeds that of said turbine runner.

4,036,082
OVERDRIVE DEVICE

Kiyoshi Onuma, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 18, 1975, Ser. No. 588,045
Int. Cl.[2] F16H *3/04, 47/08, 57/10*
U.S. Cl. 74—781 R 6 Claims



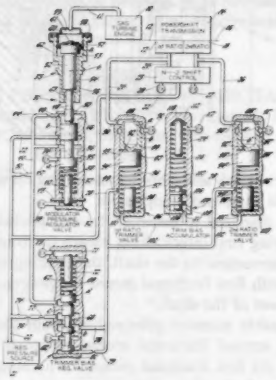
1. An improved automatic transmission with an overdrive device for an engine having a driving member comprising:
   a. a change gear mechanism having:
      i. an input shaft,
      ii. a planetary gear train, and
      iii. a plurality of frictional engagement means for interconnecting said input shaft to said planetary gear train;
   b. a torque converter having:
      i. a pump impeller connected to the driving member of the engine,
      ii. a turbine runner connected to said input shaft of said change gear mechanism,
      iii. a stator located between said pump impeller and said turbine runner, and
      iv. a converter housing for enclosing said pump impeller, said turbine runner, and said stator in fluid flow relationship therein;
   c. an overdrive device positioned outside of said converter housing between said torque converter and said change gear mechansim, said device having:
      i. an overdrive gear train including a sun gear, a carrier responsive to said pump impeller, a ring gear connected to said input shaft of said change gear mechanism for rotation therewith, and a pinion rotatably supported by said carrier and engaging said ring gear and said sun gear, said sun gear thereby being rotated by said carrier,
      ii. overdrive brake means outside of said converter housing and activated in response to the operation of said change gear mechanism for locking said sun gear against rotation whereby said ring gear is rotated by movement of said carrier in response to movement of said pump impeller, and
      iii. an intermediate shaft rotatably and co-axially disposed around said input shaft of said change gear mechanism having a first end connected to said pump impeller in said converter housing and a second end extending out of said converter housing and connected to said carrier; and
   d. a one-way clutch connecting said turbine runner to said input shaft, said one-way clutch decoupling said shaft from said turbine runner when the speed of said input shaft exceeds that of said turbine runner.

4,036,083
DRIVE ENGAGEMENT PRESSURE CONTROL BY TRIMMER BIAS CONTROL

Ted M. McQuinn, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1974, Ser. No. 501,247
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—867 5 Claims

1. In a drive and drive engagement control: fluid pressure engaged drive establishing friction means operative in response to engagement pressure for engaging to establish a drive; a source of fluid pressure; drive control means selectively supplying fluid engagement from said source to said friction means for establishing a drive; torque demand means providing a torque demand signal proportional to torque demand from idle to full torque demand; bias signal means operatively connected to said torque demand means and being controlled to provide a biasing signal having an increasing value from a minimum value to a maximum value proportional to torque demand from idle to full torque demand, to provide substantially said minimum value at all torque demand values and to increase from substantially said minimum value to said increasing value; trimmer regulator valve means connected to said friction means and having biasing means connected to said bias signal means and operative in response to the supply of engagement pressure to said friction means for controlling the engagement pressure in said friction means to provide, at idle torque demand, the minimum value biasing signal acting on said biasing means, and an initial minimum value engagement pressure permitting slip at minimum idle drive torque and the engagement pressure increasing at a low rate relative to time over a predetermined trimming time period to an intermediate engagement pressure value providing non-slip drive at maximum idle drive torque and at higher to full torque demand initially controlling said bias signal means to provide substantially said minimum value biasing signal providing substantially said same initial minimum value engagement pressure at all torque demand values and progressively increasing said biasing signal value and the engagement pressure value at a higher rate relative to time and to higher values proportional to higher to full torque demand in a significant large initial portion of said time period and then from said higher values increasing engagement pressure substantially at said same low rate to a maximum engagement pressure proportional to higher to full torque demand providing non-slip drive at higher to full drive torque.



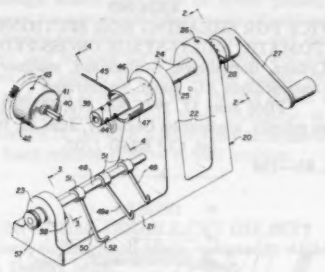
4,036,084
APPARATUS FOR REMOVING AND REPLACING SPIRAL SPRINGS IN CLOCK BARRELS

Marvin D. Schirmer, 05598 Levage Drive, Florence, Oreg. 97439

Filed Aug. 25, 1976, Ser. No. 717,536
Int. Cl.[2] G04D *3/00*; B23P *19/04*
U.S. Cl. 81—7.5 11 Claims

1. Apparatus for removing clock springs from their mountings and for replacing the springs after servicing, said apparatus comprising a support body, a spring winding and unwinding rotary shaft journaled on the support, reversible locking means for said rotary shaft to lock the same against retrograde movement selectively in opposite directions, said rotary shaft having coupling means adapted for connection releasably with a clock spring arbor, at least one transfer sleeve having an end slot adapted for placement over the rotary shaft, a second shaft

parallel to the rotary shaft on said support body and spaced laterally from the rotary shaft, and at least one clock spring end



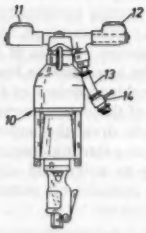
engaging and securing hook on said second shaft and shiftable axially and circumferentially thereon to selected positions of use.

4,036,085

HANDLE STRUCTURE FOR PERCUSSIVE TOOLS

Fritiof Stig Sjöstrand, Los Angeles, Calif.; Anders Gunnar Rudolf Lundmark, Stockholm, and Gosta Ivar Ekstrom, Nacka, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 18, 1976, Ser. No. 659,033
Claims priority, application Sweden, Feb. 18, 1975, 7501818
Int. Cl.² B25B *19/00*
U.S. Cl. 81—52.3 **25 Claims**



1. A handle structure for a hammer tool, said hammer tool recoiling when delivering impacts to a work surface, comprising:

a handgrip **(11, 12)** for applying pressure thereon so as to force the tool against a material to be worked, said handgrip **(11, 12)** including a wing-shaped portion **(16)**, said wing-shaped portion **(16)** projecting toward an operator, the upper side of said wing-shaped portion providing a support for the palm, thereby forming a main pressure surface;

means for pivotally connecting said handgrip to the tool at a forward portion of the handgrip, said forward portion being turned away from the operator and said wingshaped portion extending eccentrically relative to said pivotal connecting means so that recoil forces of the tool are applied eccentrically relative to the hinge of the wrist of an operator; and

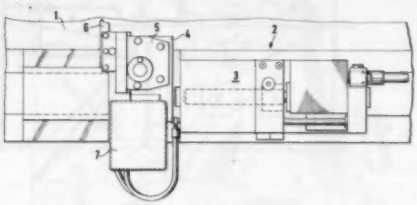
a lift surface provided in front of said pressure surface, said lift surface resting against the hand of an operator during lifting of the tool, for turning said handgrip about said pivotal connection when changing from lifting action on said lift surface to pressure action on said pressure surface.

4,036,086

THREAD CUTTING APPARATUS AND METHOD OF OPERATING SAME

Helmut Thumm, Oschweg 45, D 7418 Metzingen; Lothar Reusch, Mozartstrasse 9, D 7410 Reutlingen 27, and Rainer Wahl, Jorgiestrasse 17, D 7441 Grafenberg, all of Germany

Filed Jan. 21, 1976, Ser. No. 650,939
Claims priority, application Germany, June 14, 1975, 2526742
Int. Cl.² B23B *21/00*
U.S. Cl. 82—24 R **11 Claims**



1. A thread cutting apparatus for a turning machine of the type having a longitudinal slide path and a tool slide longitudinally movable along the path, the apparatus comprising

a tool;

means for supporting said tool on the tool slide, said means comprising

a piston and cylinder assembly including a piston member and a cylinder member, one of said members being mounted on said tool slide and being longitudinally movable with said tool slide, and the other of said members being laterally movable relative to said one member by application of fluid pressure to said assembly, said tool being mounted on said other of said members; and

means for adjusting the lateral position of said other member relative to said one member, said means including

a threaded portion on one of said members, an adjusting nut threadedly engaging said threaded portion, a drive shaft for rotatably driving said nut, a drive motor coupled to said drive shaft, pulse transmitter means coupled to said drive shaft for producing signals representative of rotation of said shaft, and means responsive to said signals fo controlling said drive motor.

4,036,087

APPARATUS FOR CUTTING STRIP MATERIAL INTO LENGTHS AND FOR STACKING THE CUT LENGTHS OF STRIP MATERIAL

Hans Braun, Weilheim, Germany, assignor to L. Schuler GmbH, Germany

Filed Nov. 25, 1975, Ser. No. 635,111
Claims priority, application Germany, Nov. 27, 1974, 2455937
Int. Cl.² B65H *35/06*
U.S. Cl. 83—79 **16 Claims**

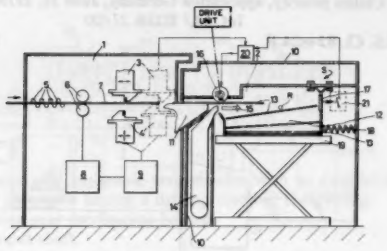
1. Apparatus for processing strip material comprising:

cutting apparatus for cutting strip material into strip portions,

stacking apparatus disposed downstream of said cutting apparatus and including means for stacking said strip portions adjacent one another, said stacking apparatus including air supply means for supplying air to respective undersides of said portions to form a cushion of air for said strip portions as they are stacked,

and an accelerating anchoring roller member engageable with said strip portions for acceleratingly conveying strip portions from the cutting apparatus to respective positions adjacent an inlet portion of said stacking apparatus where they are engaged by said air from said air supply means, said anchoring roller means forms the exclusive means for transferring said strip portions from respective positions

where they are cut to respective positions at said inlet portion of said stacking apparatus where they are engaged by and controlled by said air from said air supply means, said anchoring roller member includings anchoring means for aiding in anchoring said strip portions for movement with peripheral portions of said anchoring roller member,



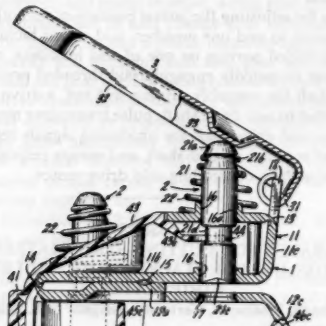
said anchoring roller member is disposed in a frame of the stacking apparatus above an air outlet of said air supply means, and control means for controlling an anchoring effect of the anchoring means as a function of the cutting process in the cutting process.

4,036,088

PAPER PUNCH WITH VARIABLE SPACING

Henry Ruskin, Cranford, N.J., assignor to Rolodex Corporation, Secaucus, N.J.

Filed Aug. 30, 1976, Ser. No. 718,968
Int. Cl.² B26F *1/02*
U.S. Cl. 83—167 **20 Claims**



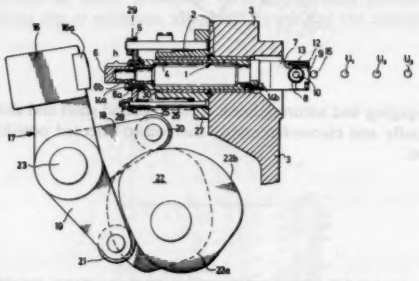
1. A punching device for punching paper and like sheet material comprising a frame, a cooperating base supporting said frame, individual punches removably and interchangeably mountable in said frame and an operating handle for actuating said punches, said frame comprising a single sheet of metal shaped to form a punch-holding section of U-cross section comprising an upper portion, a lower portion and a portion connecting said upper and lower portions at one side, the opposite side being open, and a die section joined with said lower portion by a fold line and underlying said lower portion with a space between said lower portion and said die section to receive the material to be punched, said upper portion and lower portion having aligned bearing holes to receive and guide said punches, and said die section having punching holes aligned with said bearing holes and adapted to receive the lower ends of said punches when actuated by said operating handle.

4,036,089

DEVICE FOR SHEARING ROD SECTIONS ON AN AUTOMATIC MULTI-STAGE CROSS-FED PRESS

Roger Criblez, Bottmingen, Switzerland, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland

Filed June 11, 1976, Ser. No. 695,302
Claims priority, application Germany, June 12, 1975, 2526151
Int. Cl.² B26D *1/02*
U.S. Cl. 83—198 **7 Claims**



1. An assembly for shearing rod sections with a movable cutter carriage carrying a shearing blade between a resting position and a shearing position, said assembly comprising:

a. a reciprocating impact head carried at one end of an impact lever for driving the cutter carriage,

b. means for moving the impact head into contact with an adjacent end of the cutter carriage to effect motion of the cutter carriage to the shearing position,

c. means for biasing the cutter carriage toward the impact head and the resting position to effect the return stroke motion of the cutter carriage, and

d. said biasing means includes at least one elastic element which provides a continuous biasing force,

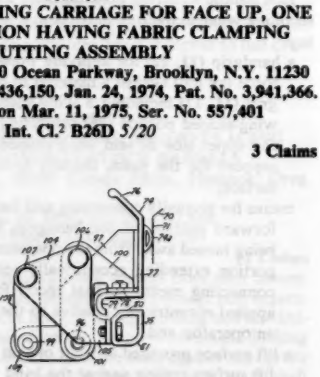
e. means for breaking contact of the impact head with the adjacent end of the cutter carriage on completion of the return stroke to draw the impact head a predetermined distance back to a starting position from which the impact head is ready to strike said adjacent end of the cutter carriage with considerable momentum upon activation of said moving means.

4,036,090

FABRIC SPREADING CARRIAGE FOR FACE UP, ONE WAY OPERATION HAVING FABRIC CLAMPING CUTTING ASSEMBLY

Jerome H. Feld, 1500 Ocean Parkway, Brooklyn, N.Y. 11230

Division of Ser. No. 436,150, Jan. 24, 1974, Pat. No. 3,941,366.
This application Mar. 11, 1975, Ser. No. 557,401
Int. Cl.² B26D *5/20*
U.S. Cl. 83—282 **3 Claims**



1. Cutter box construction for use with a wheeled fabric spreading carriage having a supply of fabric thereon from

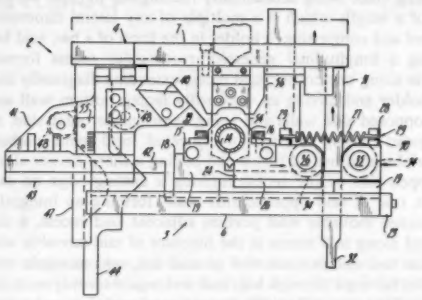
which a web of fabric emanates, said cutter box construction comprising: a housing having first and second parallel walls, said walls defining a first upper opening and a second lower opening through which said web of fabric passes, cutting means arranged for movement transversely of said web in the interstice between said first and second walls, and means supported within said housing for clamping said web selectively only between said supply and said cutting means, whereby a segment of said web severed by said cutting means may fall free through said lower opening after severance, while the remaining portion of the web is selectively maintained in predetermined fixed relation relative to said housing.

4,036,091

UNIVERSAL DOUBLE CUT DIE SET

Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed June 11, 1976, Ser. No. 695,242
Int. Cl.[2] B26D 5/22; B23D 25/06
U.S. Cl. 83—319 **4 Claims**



1. A cutoff die set operable in various mechanical press arrangements for severing elongate workpieces comprising, in combination, a lower die shoe, an upper die shoe, guide post means fixed to the shoes and interconnecting the shoes for guided relative reciprocation to effect the cutoff, and tube cutting means operated by the relative reciprocation, the guide post means consisting of three guide post bushings and three guide posts, each post being slidable in one of the bushings; the first and second of the posts having parallel axes lying spaced apart in a first plane parallel to the direction of the said reciprocation and the third post and one of the first and second posts having parallel axes lying spaced apart in a second plane parallel to the direction of the said reciprocation and approximately perpendicular to the said first plane, so that the die set is tolerant of side thrusts of various orientation exerted by a ram operating the die; the die set including clamping jaw means mounted on one of the shoes for holding a workpiece during the cutoff operation, the clamping jaw means comprising a first carriage slidably mounted on one of the shoes for movement transverse to the direction of relative reciprocation of the shoes and comprising a second carriage slidably mounted on the first carriage for movement opposite to that of the first carriage; and means operated by relative reciprocation of the shoes to move the said carriages.

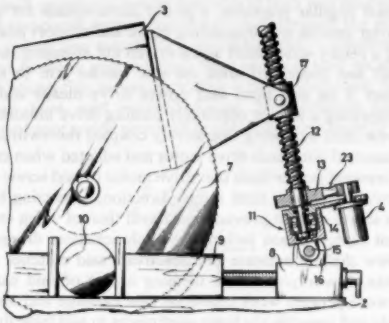
4,036,092

TABLE-MOUNTED CIRCULAR SAW

Dieter Kaltenbach, Rebweg 33, 785 Lorrach, Germany

Filed June 17, 1975, Ser. No. 587,738
Claims priority, application Germany, Nov. 8, 1974, 2452960
Int. Cl.[2] B27B 5/04, 5/18
U.S. Cl. 83—471.2 **23 Claims**

1. A table-mounted circular saw, comprising stationary support means having portions which define a working plane; an arm pivotably mounted on said stationary support means and having an end portion which is movable towards and away from said working plane; a circular saw blade rotatably mounted on said arm for movement therewith; displacement means for positively pivoting said arm, comprising two mechanical elements interengaging and movable relative to one another, one of said elements being screw spindle means oriented lengthwise of the direction of relative movement and the



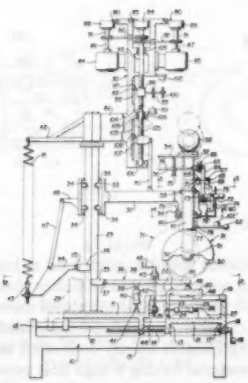
other element being spindle nut means meshing with said screw spindle means, said screw spindle means and said spindle nut means connected to said support means and said end portion of said arm, respectively, and constituting the only means for pivoting said arm with said circular saw blade relative said support means; and drive means rotating one of said mechanical elements with reference to the other mechanical element.

4,036,093

SAW FOR CUTTING TRUSS MEMBERS, RAFTERS AND THE LIKE WITH DIMENSIONAL ACCURACY

Roland H. Thorsell, Corvallis, Oreg., assignor to Excor, Inc., Corvallis, Oreg.

Filed Aug. 18, 1976, Ser. No. 715,620
Int. Cl.[2] B27B 5/20
U.S. Cl. 83—471.3 **14 Claims**



1. A power saw for cutting truss members and the like with accuracy comprising a relatively stationary base, a carriage movably mounted on the base for translation horizontally, means connected with the carriage to move it relative to the base, an upstanding guide and support post on the carriage and movable therewith, a power saw carrier arm guidably mounted on said post and movable therealong toward and

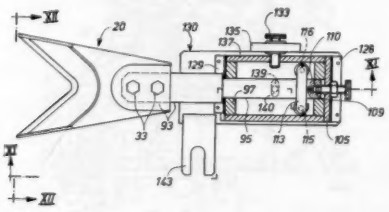
away from the base, a power saw means on said carrier arm including a vertical axis pivot shaft for the power saw means to allow turning the power saw means to various angles, cooperating adjustable angle stop means for said vertical axis pivot shaft allowing the power saw means to be positioned accurately and repetitively at various cutting angles, means to releasably hold the power saw means in selected predetermined angular positions, a power drive means for said saw carrier arm on said upstanding guide and support post including a rotary screw shaft and a driven nut engaging said screw shaft and connected with the saw carrier arm to raise and lower it on said post, said power drive means additionally comprising a pair of oppositely turning drive motors for said screw shaft and being operatively coupled therewith, a clutch connected with each drive motor and adapted when energized to transmit power from that drive motor to said screw shaft for turning the screw shaft in one direction, a coacting brake for the screw shaft to prevent overtravel thereof when energized, limit switch means including switch actuators driven by the screw shaft to activate and deactivate said clutches and said brake, a workpiece table forming a part of said carriage, a power-operated work clamp on said carriage and above said table and operable to clamp workpieces to said table during the cutting thereof by the power saw means, and a retractable power-operated workpiece positioning fence on said relatively stationary base and adapted to engage and position workpieces resting on said table prior to clamping the workpieces and retracting from the workpieces after the clamping thereof to clear said power saw means.

4,036,094

SHEARING DEVICE FOR STRANDS OF PLASTIC MATERIAL

Lothar Schaar, Heuerssen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Filed Mar. 24, 1976, Ser. No. 670,172
Claims priority, application Germany, Apr. 17, 1975, 2516854
Int. Cl.[2] B26D *5/08*
U.S. Cl. 83—623 **22 Claims**



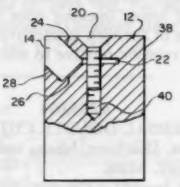
1. In a device for shearing gobs from at least one strand of plastic material, such as a strand of molten glass, a combination comprising two cooperating shear blades movable toward and away from each other, each of said shear blades comprising a frame, a cutting element fixedly connected to said frame and formed from material having a high heat penetration coefficient, high wear resistance, and good heat conductivity, each of said cutting elements having a cutting edge, a clearance face facing the other blade and including with a horizontal plane a clearance angle and which, starting from the cutting edge of one cutting element, extends away from the other blade, each of said cutting elements having, at the side opposite said clearance face, a pressure face including with a vertical plane a pressure angle and which, starting from the cutting edge of one cutting element, extends away from the other shear blade.

4,036,095

ARRANGEMENT FOR SHEARING BLADES WITH CEMENTED HARD CARBIDE INSERTS

Joseph B. Huber, Acme, and Thomas A. Brown, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Feb. 12, 1975, Ser. No. 549,305
Int. Cl.[2] B26D *7/26*
U.S. Cl. 83—674 **8 Claims**



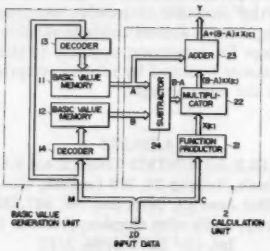
1. In a shearing blade, especially for shearing metal, the shearing blade being substantially rectangular in cross section and of a length which is a multiple of any lateral dimension thereof and comprising: a holder in the form of a bar, said bar having a longitudinal generally rectangular recess formed therein along one corner, said recess extending diagonally into the holder and having an outwardly facing bottom wall and two opposed side walls and being open on the outer side, an elongated cutting insert of a cemented hard metal carbide material seated in said recess and having a sharp corner along the open side of the recess forming a cutting edge on said insert, one of said opposed side walls forming an integrally connected movable wall portion adjacent said recess, a slot formed along said recess at the juncture of said movable wall portion and said bottom wall of said slot, said movable wall portion having a through hole and seat region transverse to the plane of the slot and within the range of said slot, and a bolt means extending through the movable wall portion and said holder such that advancing said bolt moves said opposed side walls relatively closer together clamping said insert and holding said insert compressively when said holder is in shearing operation.

4,036,096

MUSICAL TONE WAVESHAPE GENERATOR

Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, and Toshio Takeda, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed July 10, 1975, Ser. No. 594,809
Claims priority, application Japan, July 11, 9174, 49-79983; July 25, 1974, 49-85403; July 25, 1974, 49-85404
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **13 Claims**



1. A waveshape generator for generating waveshapes, for conversion into musical tones from input data consisting of plural digits and sequentially and repetitively changing in

number, said waveshape generator comprising: first means having said data coupled thereto and including a first and second memory each storing a plurality of basic amplitudes obtained by sampling one period of a waveshape at a coarse interval and a read out circuitry for producing two sequentially occurring basic amplitudes A and B in response to the value of most significant digits of the input data; and calculation means connected to said first means and receiving said input data and conducting calculation "$A + (B - A) \times X(c)$" where $X(c)$ is a selected function whose value is determined by a fraction portion C represented by least significant digits of the input as variables (provided $0 = \leqq X(c) \leqq 1$), waveshape amplitudes between the basic amplitudes A and B being sequentially calculated and output in response to the change in the value of said fraction portion C.

4,036,097

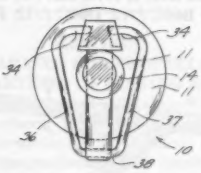
PIN FASTENER

Donald L. Greenwood, Rte. 2, Box 19A, Akron, Iowa 51001

Filed May 27, 1976, Ser. No. 690,468

Int. Cl.² F16B *21/18*

U.S. Cl. 85—5 CP **5 Claims**



1. A pin fastener for locking a bushing member on a shaft member, the shaft member having a hole formed diametrally therein proximate one end thereof, the pin fastener comprising:

an elongated pin having a head connected to one end of a shank, said shank free end having a notch formed diametrally there across and said head having a pair of elongated canted slots formed therein opposite each other with said slots being generally longitudinally disposed relative to the axis of said pin with the upper ends thereof distal said shank being closer together than the lower ends nearest said shank; and

a snap ring having an open section formed therein for providing a pair of ends with said ends pivotably and movably disposed in said slots, said ring movable from a first position with said ends disposed in said upper ends of said slots and said ring disposed in said notch to a second position with said ends disposed in said lower ends of said slots and said ring disposed distal of said notch.

4,036,098

FASTENING ELEMENT

Herbert Schruff, Friedrichstr. 44, 5508 Hermeskeil 3, Germany

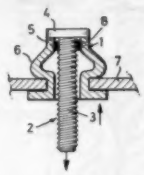
Continuation-in-part of Ser. No. 444,175, Feb. 20, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,128

Claims priority, application Germany, Sept. 28, 1973, 2348754; May 9, 1975, 2520586

Int. Cl.² F16B *13/06*

U.S. Cl. 85—70 **6 Claims**

1. A fastening element adapted to be fixed in an opening in a wall which is accessible only from a front side of the wall, said element comprising a one-piece cylindrical upsettable shell, said shell being open at opposite first and second ends, said first end being provided with an outwardly extending flange, said flange being larger than the wall opening for positioning against the front side of the wall, a cylindrical inset member disposed in said shell, engagement means provided on a rear portion of said inset member for axially moving said second end of said shell together with said inset member rear portion when said inset member is axially moved within said shell, said engagement means including an enlarged flanged head provided on said inset member rear portion, said enlarged head being disposed outside said shell for abutment of an underside surface of said enlarged head against said second end of said shell to define a closed-linkage juncture therebetween, said enlarged head having an outside diameter equal in length to outside diameter of said shell, said enlarged head being smaller than the wall opening to permit insertion of both said enlarged head and associated second end of said shell through the wall opening, connecting means for preventing relative rotational movement between said enlarged head and said shell second end, said connecting means providing a material-closure, homogeneous joint, said material-closure, homogeneous joint consisting of spot welds provided in planes running parallel to



one another, each of said spot welds being disposed inside said shell between an internal longitudinal surface of said second end of said shell and an external longitudinal surface of said inset member near said rear portion and spaced from said enlarged flanged head, said inset member being provided with screwthreaded means for threaded engagement with a screwthread device for axially moving said enlarged head toward said front end of said shell, said shell including abutment-forming means disposed between said first and second ends for enlarging outwardly to define a bulge which is larger than the wall opening when said enlarged head is moved axially toward said shell second end so that said bulge abuts against a rear side of the wall, and said screwthreaded means further being adapted to receive threaded members for fastening construction parts thereto.

4,036,099

METHOD OF LOADING BLAST HOLE WITH EXPLOSIVE

Gordon B. French, Rifle, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed July 25, 1975, Ser. No. 599,096

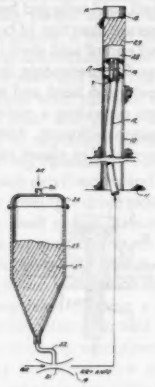
Int. Cl.² F42D *1/08*

U.S. Cl. 86—20 C **22 Claims**

22. In a method of loading explosive in an upwardly extending blast hole having an open lower end and a closed upper end wherein a conduit is inserted in the open end of the blast hole toward the closed end and a mixture of air and ANFO particles is ejected from the end of the conduit for packing ANFO in the end of the unfilled portion of the blast hole, the improvement comprising:

moistening the walls of the blast hole; and

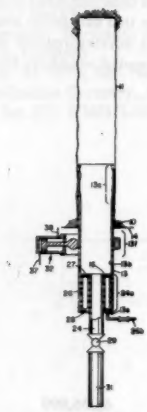
ejecting the mixture of air and ANFO particles at least partly against the moistened walls of the blast hole.



4,036,100
APPARATUS AND METHOD FOR LOADING FLUENT EXPLOSIVES IN UPWARDLY EXTENDING BOREHOLES

Eldon Kenneth Hurley, Carthage, Mo., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 7, 1976, Ser. No. 693,659
Int. Cl.[2] F42D *1/08*
U.S. Cl. 86—20 C **16 Claims**



13. A method for loading a fluent explosive into an upwardly extending borehole, comprising:

inserting into said borehole an open tubular member, retaining an open end of said tubular member outside said borehole;

expanding a portion of said tubular member into engaging contact with the adjacent borehole wall for support of said tubular member in said borehole and for closing a first space between said tubular member and said borehole wall to prevent gravitation of said fluent explosive therebetween when said fluent explosive is conveyed through said tubular member into said borehole;

inserting a conduit axially into said tubular member through said open end of said tubular member outside of said borehole to a height wherein the upper end of said conduit is below said borehole;

supporting said conduit in said tubular member;

closing at least a portion of a second space between said conduit and said tubular member sufficiently to prevent gravitation therebetween of fluent explosive when said fluent explosive is conveyed through said tubular member into said borehole;

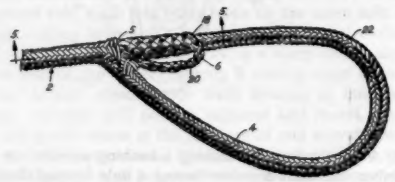
introducing said fluent explosive through said conduit, through a portion of said tubular member and into said borehole;

collapsing a portion of said tubular member below said borehole and above said upper end of said conduit sufficiently to prevent gravitation of said fluent explosive from said tubular member through the collapsed portion thereof.

4,036,101
DOUBLE HOLLOW BRAIDED ROPE ASSEMBLY AND METHOD

Ralph G. Burnett, Kenosha, Wis., assignor to The Burnett Company, Ltd., Kenosha, Wis.

Filed Dec. 1, 1975, Ser. No. 636,412
Int. Cl.[2] B66C *1/12;* **D04C** *1/12;* **F16G** *11/00*
U.S. Cl. 87—8 **12 Claims**



1. A rope assembly which comprises a flexible double braided hollow rope including an outer braided jacket having a central axial opening therein and an inner braided core having a central axial opening therein and a rope end inserted into the center of the hollow inner core along the longitudinal axis of the hollow rope to form a loop, the rope end being retained in the opening of the core against pullout by the rope braids of the hollow core gripping the rope end portion and the rope braids of the outer braided jacket gripping the core surrounding the rope end portion when tension is applied thereto.

11. The method of splicing a rope assembly of the flexible double braided hollow type which includes an outer braided jacket having a central axial opening therein and an inner braided core having a central axial opening, which comprises the steps of (1) making an opening in the braids of the outer jacket, (2) forming a loop by withdrawing a portion of the inner core through the opening, (3) inserting the end of the rope into the braids of the inner core and into the central axial opening therein, (4) manipulating the braids of the outer jacket to cover the loop of the inner core with the end of the rope therein to substantially recover the loop of the inner core, and (5) tensioning the loop so that the braids of the inner core grip the end of the rope and the braids of the outer braided jacket grip the inner core about the rope end.

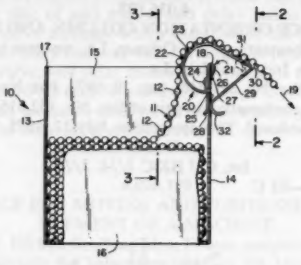
4,036,102
CARTRIDGE BELT GUIDE FOR AMMUNITION BOX

Gary J. Marrotte, 18 Red Pine Road, Medford, N.Y. 11763, and H. Christopher Mulder, 142 Wilson Ave., Long Beach, N.Y. 11561

Filed Jan. 21, 1976, Ser. No. 651,126
Int. Cl.[2] F41D *9/02*
U.S. Cl. 89—33 BB **6 Claims**

1. A cartridge belt guide for an ammunition box, which comprises clamp means disposed to engage a wall of an ammunition box for support thereby; and a guide member connected

to said clamp means for support thereby in overextending relation to an edge of said wall, said guide member having a guide surface positioned for sliding contact engagement with a cartridge belt to facilitate the withdrawal thereof from the



ammunition box, said clamp means having a generally flat surface disposed to lie against said wall on the inside of the ammunition box and having a hook portion disposed to extend around said edge from inside the ammunition box and overlie said wall on the outside of the ammunition box.

4,036,103

MAGAZINE APPARATUS FOR PROPELLANT CHARGES AND METHOD OF MAKING SAME

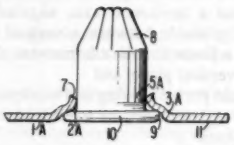
Heinz Gawlick, Vagen Post Feldkirchen-Westerham; Horst Rammensee, Nurnberg; Karl Mack, Ansbach, and Fritz Schneider, Burgbernheim, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft and Impex-Essen Vertrieb Von Werkzeugen GmbH, Germany

Filed Jan. 10, 1975, Ser. No. 540,242

Claims priority, application Germany, Jan. 19, 1974, 2402553

Int. Cl.[2] F42B *39/08*

U.S. Cl. 89—35 R **15 Claims**



1. Magazine apparatus comprising a planar strip of material, a plurality of holes extending transversely through said strip and spaced at intervals along the length of said strip, and a cartridge holding collar for each of said holes, said cartridge holding collar being a deformed portion of said planar strip and extending out of the plane of said strip, each of said collars being configured to securely engage a cartridge inserted through a respective hole in the manner of a clamping seat.

4,036,104

LIGHTWEIGHT METHOD OF CONSTRUCTION FOR RIBBED APPLIQUE ARMOR

Victor H. Pagano, Rochester, and Freeman O. Moore, Jr., Warren, both of Mich., assignors to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 17, 1976, Ser. No. 658,546

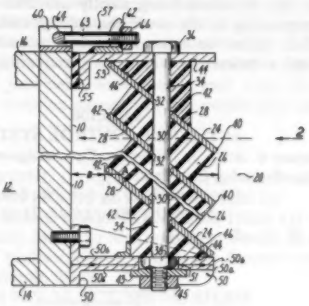
Int. Cl.[2] F41H *7/04*

U.S. Cl. 89—36 H **3 Claims**

1. In a military vehicle having outer upright walls formed of armor plate:

the improvement comprising a series of louver modules mountable on external surfaces of the armor plate to intercept enemy projectiles directed toward the vehicle:

each louver module comprising a series of flat plate louvers **(24)** arranged in spaced parallel relation at an acute angle to the general plane of the module; at least two rows of spacer blocks **(26** and **26*a*)** interposed between adjacent ones of the louvers at spaced points therealong, said spacer blocks having parallel faces engaging the louver spacing; upper and lower triangular end blocks **(42)** having first surfaces thereof engaging face areas of the endmost louvers, and second surfaces thereof extending normal to the general plane of the module; tie bolts **(34)** extending through aligned openings in the louvers and blocks; and nut means threaded onto the bolts to force the louvers tightly against the blocks;



and means for removably mounting each module on the vehicle without disconnecting the nut means from the tie bolts; each mounting means comprising a series of laterally spaced brackets **(50)** projecting from the vehicle outer walls to underlie the triangular end blocks and thereby carry the module weight; vehicle-engaging spacer means **(53)** carried by the module at its upper end for spacing the module from the vehicle external surface; and manually-operable latch means **(57)** operable to draw the module toward the vehicle surface, whereby said spacer means **(53)** and latch means **(57)** cooperably rigidify the module position.

4,036,105

MACHINE FOR EDGE FORMING OF SHEETS FOR WELDING

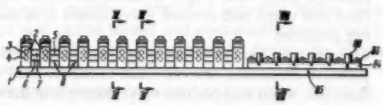
Ivan Alexeevich Sukhov, Pudozhskaya ulitsa, 4a, kv. 22; Igor Nikolaevich Soloviev, ulitsa Stoikosti, 2/11, kv. 227; Vyacheslav Mikhailovich Shults, Grazhdansky prospekt, 108, korpus 1, kv. 107; Alexandr Sergeevich Lipilov, Piskarevsky prospekt, 24, kv. 17, and Victor Reingoldovich Stilve, Grazhdansky prospekt, 23, korpus 3, kv. 76, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 573,254, April 30, 1975, abandoned.

This application Mar. 12, 1976, Ser. No. 666,502

Int. Cl.[2] B23C *3/12*; B23D *1/02*

U.S. Cl. 90—24 F **6 Claims**



1. A machine for edge forming of sheets for welding, by machining lateral edges of sheets horizontally moving in a production flow comprising: separate casings mounted in series in a spaced relation to one another; fixed cutting tools oppositely mounted along the edges of a sheet being machined; drive rolls for feeding the sheet being machined to the cutting tools, the rolls being accommodated, at least in pairs, in the

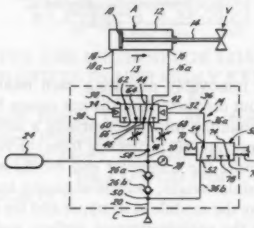
separate casings; support rollers mounted adjacent to the cutting tools above and beneath the sheet being machined; longitudinally extending beams inter-connecting in series the separate casings, the beams being disposed above and under the sheet being machined so as to form upper and lower longitudinally extending beams; the upper longitudinally extending beams supporting, between the casings, axles of the support rollers located above the sheet being machined; the lower longitudinally extending beams supporting, between the casings, the cutting tools and axles of the support rollers located beneath the sheet being machined; grooves provided on the opposite sides of the casings; and drawbars mounted in the grooves and partially received within the longitudinally extending beams in parallel with the direction of the sheet movement, the drawbars being axially movable in the direction corresponding to the movement of the casings towards one another, under the action of wedges mounted in the beams, through a distance providing for prestressing of the beams.

4,036,106

ACTUATOR CONTROL SYSTEM

Lawrence F. Athy, Jr., Houston, Tex., assignor to Southwestern Manufacturing Co., Tex.

Filed Apr. 3, 1975, Ser. No. 564,647
Int. Cl.² F15B *13/042, 21/00*
U.S. Cl. 91—5 **3 Claims**



1. A control system for controlling the operation of a valve, comprising:

a. a double-acting valve actuator having first and second portions for receiving operating fluid and being movable between a first position and a second position in response to fluid in said first and second portions, respectively;

b. a first fluid line connected to said first portion of said valve actuator for conveying fluid thereto;

c. a second fluid line connected to said second portion of said valve actuator for conveying fluid thereto;

d. single conduit means for supplying fluid under pressure to operate said valve actuator and also provide a control signal at a point thereof;

e. reverse fluid means connected to said single conduit means for accumulating fluid under pressure from the said single conduit means;

f. control valve means having an opening position and a closing position, comprising:

1. an inlet port and an outlet port conveying fluid under pressure from said single conduit means to said first fluid line when said control valve means is in the opening position;

2. an inlet port and an outlet port conveying fluid under pressure from said reserve fluid means to said second fluid line when said control valve means is in the closing position; and

3. pressure operator means responsive to the control signal to move said control valve means from the opening position to the closing position;

g. check valve means in said single conduit means interposed between said control signal point and said reserve fluid means; and

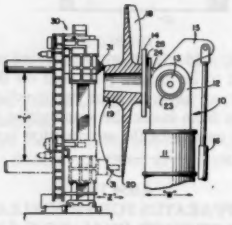
h. said reserve fluid means being of a sufficient fluid capacity to provide for a plurality of successive movements of said actuator means between said first and second positions thereof without the addition of fluid thereto from said single conduit means.

4,036,107

WORKPIECE ORIENTATION COLUMN AND PROCESS

Henry G. Constantine, New Orleans, La., assignor to Avondale Shipyards, Inc., Avondale, La.

Division of Ser. No. 389,446, Aug. 20, 1973, Pat. No. 3,917,249, which is a continuation-in-part of Ser. No. 152,816, June 14, 1971, abandoned. This application July 17, 1975, Ser. No. 596,957
Int. Cl.² B23C *1/14, 3/16*
U.S. Cl. 90—11 C **13 Claims**



1. A process for machining with a milling machine having a milling head a large, complex, three dimensional workpiece having at least two faces, comprising the steps of:

a. Rigidly mounting at least one face of said workpiece to a supporting member spaced from said milling machine;

b. Continuously machining said workpiece with said milling machine during a period of time;

c. During said period of time, continuously moving said workpiece with respect to at least one of the following five axes of motion, angularly about a vertical axis, angularly about a horizontal axis, angularly about an axis which is rotatable between a vertical and a horizontal position, a linear axis in a horizontal plane, and a linear axis in a vertical plane; and

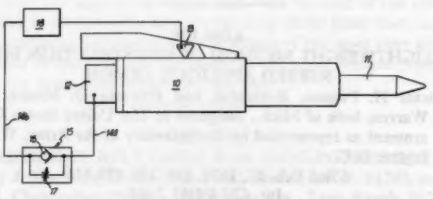
d. During said period moving said workpiece at one or more points in time with respect to each of the angular ones of said five axes.

4,036,108

PRESSURE FLUID OPERATED PERCUSSION TOOLS

Reginald Andrew Phillips, Warrington, England, assignor to Dobson Park Industries, Ltd., Colwick, England

Filed Sept. 12, 1975, Ser. No. 612,915
Int. Cl.² F01L *25/06*
U.S. Cl. 91—165 **5 Claims**



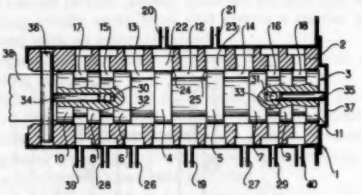
1. In a percussion tool having a hammer piston slidably mounted in a cylinder, said piston being driven in one direction by first fluid means applied to said cylinder on one side of the piston which acts to compress second fluid means on the other side of the piston, said second fluid means when compressed being subsequently allowed to expand by exhausting said first

fluid means from said one side of the piston and drive said piston in the opposite direction, the improvement comprising: pressure responsive valve means controlling the application and exhausting of said first fluid means to and from said cylinder, and delay means coupled between said valve means and said other side of said piston, said delay means including a restrictor valve through which the fluid of the second fluid means flows and a one-way valve arranged in parallel with the restrictor valve, said delay means being operable to selectively delay or retard the manifestation of a change in pressure of said second fluid means to said valve means whereby the rate of operation of said tool is reduced.

4,036,109
DEVICE FOR MOVING AND POSITIONING AN ELEMENT OF A MACHINE

Paul Wolff, Illkirch Graffenstaden, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Division of Ser. No. 363,160, May 23, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,226
Claims priority, application France, May 23, 1972, 72.18292
Int. Cl.[2] F01B *15/00;* F15B *13/16*
U.S. Cl. 91—216 A **22 Claims**



1. A device including a servo-valve for controlling the flow of pressurized fluid between a supply duct leading into said servo-valve and first and second servo-valve outlet ducts; said servo-valve comprising:

a sleeve,

a valve shaft arranged in said sleeve for longitudinal sliding movement relative to said sleeve between two end positions,

a plurality of shoulders formed on said valve shaft for separating the space between the sleeve means and valve shaft into a plurality of chambers including a distribution chamber communicated with said supply duct which is formed between a first and second of said shoulders, a first fluid return chamber formed between the first shoulder and a third of said shoulders, and a second fluid return chamber formed between the second shoulder and a fourth of said shoulders, said first and second return chambers being connected to respective first and second fluid return lines,

a first bore leading to said first outlet duct and extending through the sleeve to a first opening located adjacent travel positions of said first shoulder, said first opening having a longitudinal dimension corresponding approximately to the longitudinal thickness of said first shoulder such that said first shoulder effects varying degrees of closing of said first opening during relative movement of said sleeve and valve shaft with a resultant variation in fluid pressure supplied through said first bore to said first outlet duct,

a second bore leading to said second outlet duct and extending through the sleeve to a second opening located adjacent travel positions of said second shoulder, said second opening having a longitudinal dimension corresponding approximately to the longitudinal thickness of said second shoulder such that said second shoulder effects varying degrees of closing of said second opening during relative movement of said sleeve and valve shaft with a resultant variation in fluid pressure supplied through said second bore to said second outlet duct,

first and second control compartments having volumes which vary in opposite proportions with respect to one another during relative movement of said valve shaft,

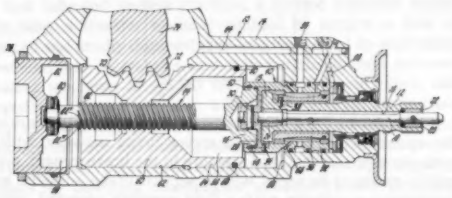
first and second control ducts leading from a fluid control circuit to said respective first and second control compartments for applying control fluid pressure to said control compartments to control the relative movement of the sleeve and valve shaft;

and said device further comprising a fluid operated jack having: first and second jack units, one of said jack units being mobile and one being relatively fixed, said first jack unit including a first jack element formed as a hollow body, said second jack unit including a second jack element formed as a piston separating the inside of the hollow body into first and second compartments communicating respectively with said first and second outlet ducts such that changes in pressure supplied to said first and second outlet ducts effects relative movement of said first and second jack units, and wherein said valve shaft is coupled by coupling means with said mobile jack units.

4,036,110
POWER STEERING GEAR WITH PISTON NUT AND SCREW OPERATIVELY CONNECTED BY CENTRALIZING ROOT DIAMETER THREAD

David A. Galonska; James B. McCarthy, and Joseph A. Rutkiewicz, all of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1975, Ser. No. 631,838
Int. Cl.[2] F15B *9/10, 13/10*
U.S. Cl. 91—375 A **3 Claims**



1. A power steering gear unit comprising a housing, an input member operatively mounted for turning movement in said housing and extending outside one end thereof, an output member operatively mounted for turning movement in said housing, piston means mounted for longitudinal sliding movement in said housing and cooperating therewith to provide first and second expansible and contractible fluid pressure chambers therein, gear means drivingly connecting said piston means to said output member so that said output member turns in response to sliding movement of said piston means, valve means in said housing operatively connected to said input member and having a connection to a source of pressurized hydraulic fluid for selectively supplying and exhausting pressurized fluid to and from said chambers to hydraulically move said piston means and said connected output member to predetermined positions as controlled by the amount of movement of said input member, elongated actuator means extending through said piston means and operatively connected to said input member for turning movement therewith, mechanical drive means operatively interconnecting said actuator means and said piston means to permit said actuator means to move said piston means in said housing, said mechanical drive means comprising first thread means formed externally on said actuator and second thread means formed internally in said piston, said second thread means having a screw thread profile with a major diameter spaced from a major diameter of the second thread means and a minor diameter which directly contacts a minor diameter of the thread of said first thread means to decrease a friction radius between said piston and said actuator means to facilitate the movement of said piston by said actuator

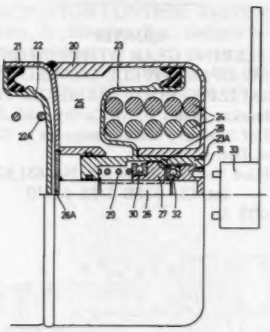
means and further to reduce an axial flow path of fluid through said piston means so that pressure differentials can be built up in said chambers for the hydraulic actuation of said piston means.

4,036,111

DEVICE FOR DISCONTINUING AND AUTOMATICALLY RESTORING THE OPERATIONAL FUNCTION OF A SPRING BRAKE ACTUATOR

Nils Goran Dahlkvist, Darlington; Lars Bengt Axelsson, Newton Aycliffe, both of Durham, England, and Nils Borje Lennart Sander, Malmo, Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Division of Ser. No. 639,407, Dec. 10, 1975, Pat. No. 3,994,206, which is a continuation of Ser. No. 514,929, Oct. 15, 1974, abandoned. This application June 29, 1976, Ser. No. 700,895
Claims priority, application Sweden, Oct. 25, 1973, 7314472
Int. Cl.[2] F01B *9/00*
U.S. Cl. 92—29 **3 Claims**



1. In a device for discontinuing and automatically restoring the operational function of a spring brake actuator with a spring compressed by fluid pressure in the brake system, preferably arranged in series with a service brake actuator and comprising a cylinder with a fluid pressure operated piston movable therein to operate a brake push rod and having a spring actuating the piston in an operation direction forward for brake application at the fall of fluid pressure acting on the piston, the combination comprising, a conveying mechanism carried by the push rod comprising a rotatable nut engaging threads on said push rod and forming a clutch held in continuous engagement between said push rod and said piston to prevent nut rotation during all normal operation so that no parts of the conveying mechanism move relative to each other under normal conditions, manually operable means mechanically disengaging the clutch to permit a return of the push rod alone without influence by said spring when fluid pressure is not acting on the piston, and means operable when said clutch is disengaged during a single movement return stroke of said piston in response to fluid pressure automatically rotating said nut to a position on said push rod reconnecting said clutch thereby reconnecting said push rod into said continuous engagement with said piston whereby said clutch is disengaged only for one brake system stroke following manual disengagement during said fall of fuid pressure.

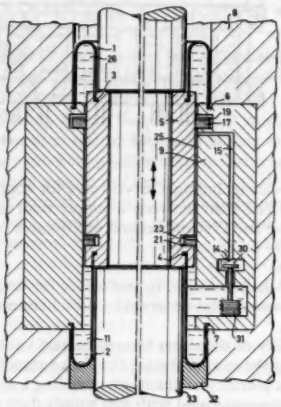
4,036,112

ROLLING DIAPHRAGM SEALING DEVICES

Karl-Wolfgang Hubschmann, Langweid, Germany, assignor to Motoren-Werke Mannheim AG, Mannheim, Germany

Filed June 30, 1975, Ser. No. 592,073
Claims priority, application Germany, July 2, 1974, 2431745
Int. Cl.[2] F15B *21/04*
U.S. Cl. 92—80 **7 Claims**

1. In combination,
an internal part;
a housing defining a bore receiving said internal part, one of said internal part and said housing being reciprocable relative to the other longitudinally of said bore;
a first annular rolling sealing diaphragm havig external and internal annular edges respectively connected in a fluid-tight manner to said housing and to said internal part;
a second annular rolling sealing diaphragm spaced from the first diaphragm longitudinally of said bore and having external and internal annular edges respectively connected in a fluid-tight manner to said housing and to said internal part,
portions of the first diaphragm facing the second diaphragm bounding a first annular chamber for receiving a diphragm-supporting liquid to support said first diaphragm against a relatively low pressure in said bore;
pumping means operable by the relative reciprocation between said internal part and said housing to pump liquid from said second chamber to said first chamber to compensate for leakage losses from said first chamber;
return ducting leading to said second chamber for returning said liquid thereto;



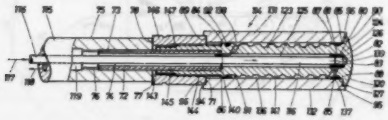
return flow regulating means arranged to regulate the flow of said liquid through said return ducting; and
pressure-responsive control means arranged to control said regulating means;
said housing including surface portions in which said second diaphragm seats in its axially outer end position; and
said pumping means comprising a mobile annular one-way seal carried by said one of said internal part and said housing at a location intermediate the first and second diaphragms and bearing sealingly and slidably on said other of said internal part and said housing for displacing said liquid, and another annular one-way seal carried by said other of said internal part and said housing at a location intermediate the first and second diaphragms and bearing sealingly on said one of said internal part and said housing and disposed nearer to said first chamber than is said mobile annular one-way seal, portions of said internal part, said housing, said mobile annular one-way seal, and said other annular one-way seal defining a pumping chamber of said pumping means from which said return ducting extends.

4,036,113

PRESSURE PISTON FOR A DIE-CASTING MACHINE

Hugo Kunz, Ziegeleistrasse 21, (D-7743) Frickenhausen, Germany

Filed Sept. 26, 1975, Ser. No. 616,993
Claims priority, application Germany, Sept. 28, 1974, 2446503; Oct. 8, 1974, 2447980
Int. Cl.[2] F01B *29/00, 31/00;* F16J *1/10*
U.S. Cl. 92—111 29 Claims



1. A plunger for a die-casting machine, said plunger comprising:

a carrier having and elongated along a longitudinal axis, said carrier being formed at one axial end with a piston crown and at said crown with a radially projecting flange and with a blind bore extending to immediately adjacent said crown and opening at the other axial end of said carrier, said carrier further having centered on said axis and extending axially away from said crown a carrier portion formed with an external thread;

a clamping ring threaded onto said thread at said carrier portion; and

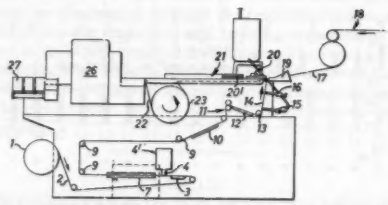
a detachable piston skirt formed as an axially elongated sleeve having a central portion radially spacedly surrounding said carrier and braced axially between said flange and said ring, said carrier portion extending axially away from said crown past said ring.

4,036,114

APPARATUS FOR CIGARETTE FILTER MANUFACTURE

John Anthony Luke, Romsey, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed July 28, 1976, Ser. No. 709,346
Claims priority, application United Kingdom, Aug. 11, 1975, 33430/75
Int. Cl.[2] A24C *5/50;* B05C *5/02*
U.S. Cl. 93—1 C 3 Claims



1. In an apparatus for forming cigarette filter rods in which a filter material in the form of a processed tow and a porous filter wrapping paper are each directed along a perdetermined pathway from a supply source to a garniture for combination thereat, said apparatus including a said garniture, means feeding said tow from said supply, through a collector funnel and to said garniture, and an adhesive applicator means positioned along said pathway intermediate said supply source and said garniture and being adapted to apply adhesive to a predetermined area on said paper, the improvement comprising

a. an additional applicator means positioned along said pathway intermediate said supply source and said adhesive applicator means, said additional applicator means being adapted to apply a film-forming material to a predetermined area of said paper and being positioned a sufficient distance from said adhesive applicator means to permit drying of said film-forming material to an impervious film prior to said film-forming material reaching said adhesive applicator means;

b. guide means for guiding said paper to said adhesive applicator means, whereby said adhesive is applied to a predetermined area coinciding with the area covered by said impervious film; and

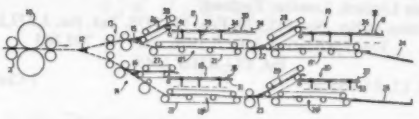
c. means guiding said adhesive coated paper to said garniture to effect wrapping of the paper about said tow.

4,036,115

SACK MAKING EQUIPMENT

Ronald Frank Hatch, Grays Point, Australia, assignor to St. Regis-Aci Pty. Limited, Botany, Australia

Filed July 28, 1975, Ser. No. 599,511
Claims priority, application Australia, Aug. 8, 1974, 8452/74
Int. Cl.[2] B31B *21/02*
U.S. Cl. 93—8 R 35 Claims



1. A bag making machine comprising a tubing machine having means for forming a tube of suitable material, and means for cutting the formed tube into tube-lengths and axially discharging the tube-lengths therefrom, each said tube-length being spaced apart during discharge from said tubing machine, a first tube-end sealing machine, a second tube-end sealing machine, a transfer machine adapted to receive a flow of spaced and axially disposed tube-lengths formed by said tubing machine and to transfer said tube-lengths to said tube-end sealing machines in spaced relationship to each other, said transfer machine comprising: a first feed conveyor feeding said first tube-end sealing machine, a second feed conveyor feeding said second tube-end sealing machine, each said feed conveyor having a receiving end and a discharge end, first flow directing means for directing tube-lengths selected by said first flow directing means from said flow of spaced tube-lengths received at an input to said transfer machine in a cyclic predetermined sequence to said receiving end of said first feed conveyor, second flow directing means, said first flow directing means operable to direct the remaining tube-lengths of said flow to said second flow directing means by-passing said first feed conveyor, said second flow directing means operable to direct tube-lengths received at said second flow directing means to said receiving end of said second feed conveyor or to a discharge.

4,036,116

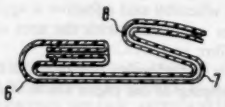
METHOD OF STACKING FLAT BAGS OR SACKS WHICH ARE FOLDED ABOUT AT LEAST TWO TRANSVERSE FOLD LINES

Konrad Tetenborg, and Rudolf Telljohann, both of Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed Feb. 3, 1976, Ser. No. 654,921
Claims priority, application Germany, Feb. 5, 1975, 2504801
Int. Cl.[2] B31B *1/26*
U.S. Cl. 93—32 2 Claims

1. A method of stacking flat bags or sacks which are folded about at least two transverse fold lines and are open at one end, with a reinforced margin at the opening being formed by a plurality of layers that include handle apertures, the method comprising the steps of folding the margin portion of the bag onto the central bag or sack portion about a fold line disposed below the reinforcing layers, folding the base portion of the bag or sack about two fold lines in Z formation onto the central

bag or sack portion in such a way that the fold line of the base portion which is nearer the margin at the opening of the bag



stops short of or just touches the outer edge of the margin, and stacking the folded bags on one another.

4,036,117

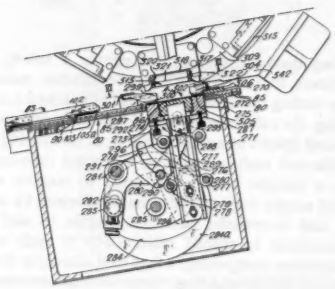
PACKING MACHINES

Robert W. Davies; Leonard Thornton; Maxwell F. Veness, and Leonard H. Calver, all of London, England, assignors to Molins Limited, London, England

Division of Ser. No. 443,938, Feb. 19, 1974, Pat. No. 3,977,157. This application July 7, 1976, Ser. No. 703,383

Int. Cl.[2] B31B *1/46*

U.S. Cl. 93—51 R **7 Claims**



5. Apparatus for folding a blank of a packet, in particular a hinged lid cigarette packet, comprising first and second folders which are stationary and spaced apart for successively folding edge portions of the blank during movement thereof, a movable platform having at least two sections for supporting the blank, the sections having supporting surfaces parallel to one another and being movable relative to one another in a direction perpendicular to said supporting surfaces, and drive means operable cyclically to move all the sections of the platform past the first folder and to continue moving at least one section of the platform past the second folder while leaving at least one of the other sections stationary.

4,036,118

ROD-LIKE ARTICLES

Rolf Penzias, London, England, assignor to Molins Limited, England

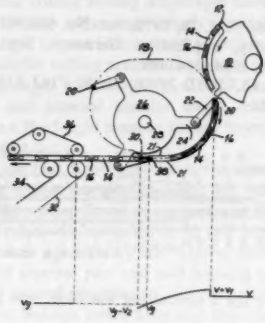
Filed Mar. 11, 1976, Ser. No. 665,860

Claims priority, application United Kingdom, Mar. 15, 1975, 10896/75

Int. Cl.[2] F01B *29/00*

U.S. Cl. 93—77 FT **12 Claims**

1. Apparatus for feeding rod-like articles in succession comprising a drive member rotatable about an axis, a cam track surrounding the axis, a plurality of feed members connected to the rotatable drive member and constrained to follow a course determined by the cam track when the drive member is rotated about its axis, guide means defining a path associated with part of said course, and means for feeding groups of in line rod-like articles onto said path, each feed member being arranged to engage the trailing end of the rear article of a group at a pick-up point on said path and convey said group along said path past a release point on said path, the distance between said path



and said axis progressively decreasing over at least part of said path between said pick-up point and said release point.

4,036,119

METHOD AND MACHINE FOR THE PRODUCTION OF COMPOSITE FILTER MOUTHPIECES

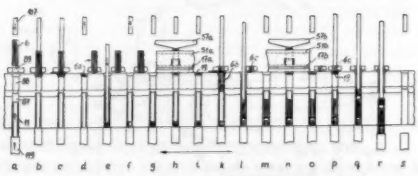
Bernhard Schubert, New Bornsen, and Otto Blidung, Geesthacht, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 483,668, June 27, 1974, Pat. No. 3,961,633, which is a division of Ser. No. 275,096, July 25, 1972, Pat. No. 3,834,285. This application Feb. 9, 1976, Ser. No. 656,712

Claims priority, application Germany, July 26, 1971, 2137318; July 26, 1971, 2137319; Sept. 10, 1971, 2145375

Int. Cl.[2] A24C *5/50*

U.S. Cl. 93—77 FT **14 Claims**

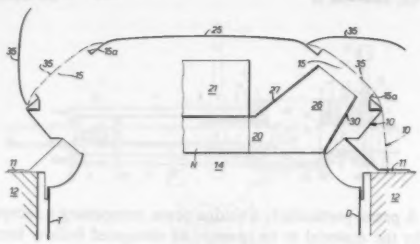


1. A method of making composite filter mouthpieces, comprising the steps of moving a continuous web of wrapping material lengthwise; placing onto one side of the moving web a single file of axially spaced filter plugs and moving the filter plugs with the web; placing filter disks between successive plugs of said file, including individually holding each of the filter disks at one axial end thereof and positioning each of the thus held filter disks in abutment with one of the adjacent filter plugs, and moving the filter disks with the web and filter plugs; draping the web around the filter plugs and filter disks to form an elongated filter rod wherein filter plugs alternate with filter disks, including connecting said filter disks with the abutting filter plugs by means of said wrapping material; and severing the filter rod to form a plurality of discrete mouthpieces each of which contains at least one filter disk and at least a portion of at least two filter plugs.

4,036,120
VENTILATORS

Raymond Alfred Frank Burtenshaw, Clanfield, England, assignor to Colt International Limited, Hampshire, England

Filed Nov. 14, 1975, Ser. No. 631,905
Int. Cl.² F24F 7/06
U.S. Cl. 98—43 R **16 Claims**



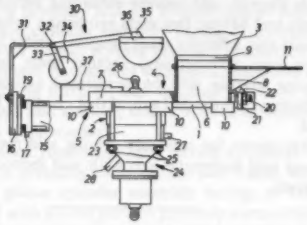
1. A powered extract roof ventilator comprising:
a fan including a fan impeller,
a body housing presenting a bottom ventilation opening to be positioned in the roof structure, and having a top wall for weathering the ventilation opening and a plurality of side walls which are downwardly and outwardly inclined from said top wall at a substantial angle to the vertical and horizontal, the body housing have side openings on all sides thereof, said openings each being formed in a respective side wall of the body housing which is downwardly and outwardly inclined from said top wall at a substantial angle to the vertical and horizontal, each side opening being defined by a surrounding wall on the outside of the inclined side wall and projecting outwardly of the body housing to form a gutter with the side wall to drain water down the outside of the side wall portions around the respective opening, the fan impeller being housed in the body housing and being arranged to draw air into the body housing through said ventilation opening and to discharge air through said side openings, and
dished flaps associated respectively with each of said side openings, said dished flaps being located on the outside of the body housing in registration with its respective side opening and hinged to the body housing so as to be swingable between open and closed positions in which each flap guies air discharged through the respective side opening and closes the respective side opening respectively, each flap in its closed position overhanging the complete surrounding wall defining the respective side opening to the outside thereof and in spaced relation thereto around its whole periphery, thereby to weather the respective side opening.

4,036,121
BREWING APPARATUS FOR BEVERAGE-BREWING MACHINE

Karl Bieri, Zurich, Switzerland, assignor to Hagezet-Aktiengesellschaft, Zurich, Switzerland

Filed Oct. 1, 1975, Ser. No. 618,333
Claims priority, application Switzerland, Oct. 2, 1974, 13270/74
Int. Cl.² A47J 31/00
U.S. Cl. 99—289 R **5 Claims**

1. Apparatus employing a brewing liquid for brewing beverages from a grund or powdered material insoluble in the brewing liquid comprising:
A base plate,
means integral with said base plate defining a stationary beverage brewing chamber having an inlet opening,
a container for storing the material to be brewed, said container having an outlet,
an intermediate member which is movable with respect to the base plate between a first and second position along the predefined path,
a brewing head and a transport container carried by said intermediate member and spaced apart along the path of movement of the intermediate member, said brewing head including means cooperating with said brewing chamber for pressure sealing the inlet opening thereof when said intermediate member is in said first position, said transport container having an inlet and an outlet and being constructed and arranged so that said transport container inlet

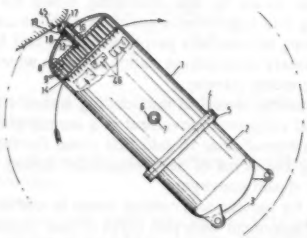


is aligned with said storing container outlet when said intermediate member is in said first position and so that said transport container outlet is aligned with said brewing chamber inlet when said intermediate member is in said second position, and
means for moving said intermediate member from said first position wherein said transport container receives material from said storing container to said second position wherein the transport container outlet dispenses material into said brewing chamber and the brewing head is out of operative relationship with said brewing chamber.

4,036,122
APPARATUS FOR TREATING MEAT, MORE PARTICULARLY HAM MEAT

Christianus Petrus Langen, Cuyk, Netherlands, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Division of Ser. No. 571,592, April 25, 1975. This application Jan. 19, 1976, Ser. No. 650,249
Int. Cl.² B02B 3/12, 23/00; A22C 9/00; A23L 1/31
U.S. Cl. 99—533 **12 Claims**



9. A meat curing machine comprising:
a. a meat curing tank closed to contain a curing fluid,
b. means for mounting said tank for rotation about a horizontal axis,
c. said meat curing tank having at least two elongated meat curing chambers each having a radial axis and having side walls extending away from said horizontal axis, said radial axes being circumferentially spaced from one another,
said chambers each having a closed end at the radially outer end thereof and an open end thereopposite, the open end of one chamber communicating with the open

end of each other chamber in a common open end of the curing tank,

d. a second tank having a meat storage chamber formed therein, said storage chamber having an open inner end adapted to sealingly engage said common open end of said curing tank to place said storage chamber in sealed communication with said meat curing chambers,

e. means for releasably securing said second tank with respect to said curing tank for rotation therewith,

f. a plurality of meat penetrating needles mounted in each of said curing chambers and supported at the radial outer ends thereof, said needles extending parallel to said side walls and having free ends projecting towards said horizontal axis whereby meat tumbling under its own weight from one chamber into another meat curing chamber having needles will be penetrated substantially in the direction of the radial axis of that chamber by the needles, and

g. drive means for rotatably driving said meat curing tank about said horizontal axis with said second tank secured thereto.

4,036,123

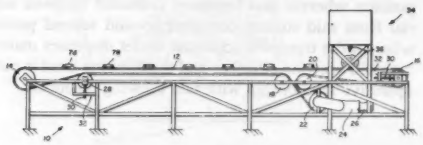
MACHINE OF CUTTING CORES OF VEGETABLES

James Elliott Conkey, Seneca Falls, N.Y., assignor to Kibbey Machine Company, Incorporated, Seneca Falls, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,032

Int. Cl.[2] A23N *23/00, 4/12*; A47J *23/00, 25/00*

U.S. Cl. 99—538 **3 Claims**



1. A machine for cutting or sectioning the cores of leafy vegetables such as heads of cabbage or the like, said machine comprising:

a. an elongated supporting frame having a feed end and a discharge end;

b. conveying means mounted on said frame for continuous travel substantially along a first plane at a uniform linear speed from said feed end to said discharge end;

c. retainer means on said conveying means for releasably holding said vegetables in positions with the cores thereof extending substantially perpendicular to said first plane;

d. a stationary core cutting station through which said conveying means travels;

e. core cutting means at said cutting station mounted for cyclical reciprocal movement in a second plane substantially perpendicular to said first plane for engaging and cutting the cores of said vegetables during continuous travel of said conveyor;

f. means for moving said cutting means in said second plane into engagement with said cores of said vegetables when said vegetables reach said cutting station, said moving means moving said cutting means at a cyclical speed relative to said continuous uniform linear speed such that said cutting means completes a core cutting operation before said conveying means has traveled more than an incremental distance whereby it is unnecessary to stop said conveying means during said core cutting operation; and

g. means actuated by said cutting means when moved in the direction of engagement with said cores of said vegetables for withdrawing said cutting means in said second plane at the end of the core cutting operation without separating said vegetables into discrete portions whereby substantially all of said vegetables are retained for subsequent use.

4,036,124

SLUDGE PRESS

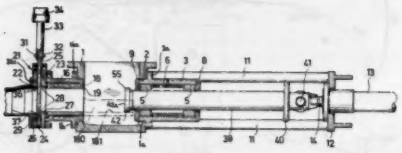
Niklaus Seiler, Neuenhofstr. 20, 5600 Lenzburg, and Hanspeter Seiler, Erzgrubenweg 18, 5000 Aarau, both of Switzerland

Filed Mar. 14, 1975, Ser. No. 558,717

Claims priority, application Switzerland, Mar. 18, 1974, 3701/74

Int. Cl.[2] B30B *15/08, 1/32*

U.S. Cl. 100—98 R **26 Claims**



1. A press, particularly a sludge press, comprising a receptacle for the material to be presses; an elongated hollow barrel having an open rear end in communication with the interior of said receptacle and an open front end; a piston reciprocable in line with said barrel between a retracted position in which the material in said receptacle can enter the rear end of said barrel and an extended position in which said piston is located in and at least close to said front end of said barrel, said piston having a front face and a first annular cutting edge surrounding said front face and said barrel having at said rear end thereof a complementary second annular cutting edge through which said piston passes during movement toward said extending position; and a valve provided at said front end of said barrel, said valve having a valve member movable between a first position in which said front end of said barrel is at least substantially sealed, particularly during movement of said piston from said extended position, and a second position in which said front end is exposed so that said piston can expel material from said barrel forwardly during movement to said extended position thereof.

4,036,125

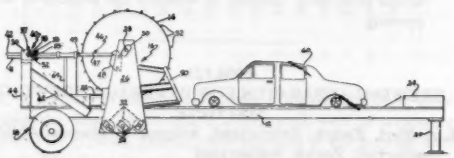
TRAILER MOUNTED AUTOMOBILE CRUSHER

John R. Mezei, 3940 Knapp NE., Grand Rapids, Mich. 49505

Filed Jan. 16, 1976, Ser. No. 649,750

Int. Cl.[2] B30B *3/02*

U.S. Cl. 100—100 **13 Claims**



1. A vehicle crusher for flattening automobiles or the like comprising:

a reinforced, elongated bed;

a crushing roller positioned on and perpendicular to the length of said bed and mounted for vertical movement relative thereto during crushing;

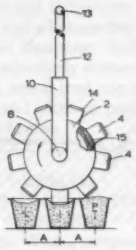
means operatively connected to said roller for powering the roller along the length of the bed; and

means extending below and connected to the roller and movable vertically with said roller for limiting the vertical movement of said roller from said bed as said roller is powered down the bed and over a vehicle to be crushed.

4,036,126
DEVICE FOR STAMPING SOIL INTO GROUPS OF GROWTH POTS

Marius Gundersen, Larvik, Norway, assignor to Vefi A/S, Norway

Filed Mar. 1, 1976, Ser. No. 662,310
Claims priority, application Norway, Mar. 5, 1975, 750739
Int. Cl.[2] B30B *3/02, 9/00;* B65B *1/24*
U.S. Cl. 100—210 1 Claim

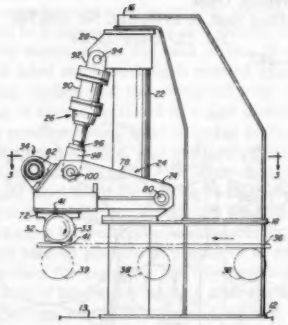


1. A device for tamping soil in groups of stationary soil-filled growth pots positioned in evenly spaced side by side relationship comprising a cylindrical roller rotatably supported in a holder having a rodlike handle at its end opposite said roller, said roller including longitudinally and circumferentially evenly spaced tampering projections, the longitudinal and circumferential spacing between the center of the outer surface of each adjacent projection being equal and corresponding to the spacing between the centers of any of said adjacent pots, each projection having a cross-sectional shape substantially conforming to the shape of the opening of said pots, the outer end of each projection being substantially flat and having a bevelled edge around the perimeter thereof to facilitate the entrance of the projection into the open end of said pots to tamp the soil therein, said projections which are in longitudinal alignment being affixed to a supporting plate and said supporting plate being secured to said roller.

4,036,127
PLATE MARKING APPARATUS

Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Filed Oct. 23, 1975, Ser. No. 625,059
Int. Cl.[2] B41F *17/00*
U.S. Cl. 101—5 8 Claims



1. Apparatus for impressing a preselected mark on the surface of an object to be marked comprising,

a frame,

a support member secured to said frame,

a carriage mounted for vertical and lateral movement on said support member,

marking means to impress a preselected mark upon a surface of the object to be marked, said marking means including marking elements, said marking means rotatably supported on said carriage,

drive means mounted on said carriage and drivingly connected to said marking means for rotating said marking means through a single revolution to urge said marking elements into marking engagement with the surface of the object to impress preselected marks thereon,

a first piston cylinder assembly having a cylinder with an end portion pivotally secured to said support member,

said first piston cylinder assembly having an extensible piston rod with an end portion pivotally connected to said carriage so that extension of said piston rod exerts a preselected marking force on said marking means to position and maintain said marking means in marking relation with the object to be marked,

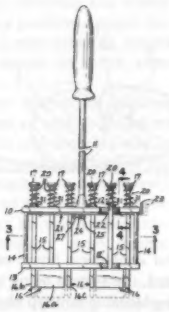
a second piston cylinder assembly having a cylinder with an end portion pivotally connected to said frame, and

said second piston cylinder assembly having an extensible piston rod with an end portion pivotally connected to said carriage so that actuation of said piston cylinder assembly extends and retracts said piston rod to laterally swing said carriage in a horizontal plane.

4,036,128
BRANDING IRON WITH QUICKLY CHANGEABLE CHARACTERS

Harlan Easton, R.F.D. 3, Blooming Prairie, Minn. 55917

Filed Mar. 5, 1976, Ser. No. 664,405
Int. Cl.[2] A01K *11/00*
U.S. Cl. 101—9 1 Claim



1. A portable instrument for branding animals, comprising, in combination:

a base plate;

a handle projecting out of one surface of said base plate in a first direction;

a guide plate;

means mounting said guide plate spaced from and substantially parallel to said base plate on the side thereof removed from said handle;

a plurality of non-circular rods slidable through like non-circular aligned holes in said base and guide plates, to project therebeyond;

a like plurality of heatable marking elements fixed to the ends of said rods which extend beyond said guide plate, said elements being configured and positioned to jointly define the sides and midlines of a plurality of adjacent rectangular figures;

finger buttons fixed to the ends of said rods which extend beyond said base plate;

resilient means acting between said base plate and said finger

buttons for normally maintaining said elements against said guide plates;

detent means carried by said rods for holding them individually in working positions in which they define a working plane;

release means traversed by said rods for engagement by said detent means in the working positions of said rods and operable out of a normal position to simultaneously release the detents of all rods which are in working position;

and means resiliently urging said release means into said normal position,

the displacement between said base plate and said guide plate being such that heat conduction from such marking elements is not detrimental to said resilient means and said detent means.

4,036,129
SQUEEGEE DEVICE

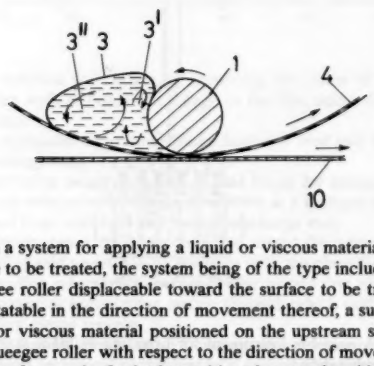
Johannes Zimmer, Ebentalerstrasse 133, 9020 Klagenfurt, Austria

Filed Oct. 9, 1975, Ser. No. 621,212

Claims priority, application Austria, Oct. 15, 1974, 8277/74; Aug. 25, 1975, 6532/75

Int. Cl.² B41F *15/44*

U.S. Cl. 101—120 **6 Claims**



1. In a system for applying a liquid or viscous material to a surface to be treated, the system being of the type including a squeegee roller displaceable toward the surface to be treated and rotatable in the direction of movement thereof, a sump of liquid or viscous material positioned on the upstream side of said squeegee roller with respect to the direction of movement of the surface, and a feed tube positioned to supply said material to said sump; the improvement comprising:

a plate element extending from said feed tube and supported thereby at a position to contact said upstream side of said squeegee roller;

said plate element extending along the entire length of said squeegee roller;

said plate element having thereon seal means to prevent passage of said liquid or viscous material from said sump wardly between said plate element and said squeegee roller;

and

a lowermost edge of said plate element being positioned to extend beyond the rotational axis of said squeegee roller toward the surface to be treated and spaced from such surface;

whereby said plate element thus positioned prevents said sump from retarding rotation of said squeegee roller.

4,036,130
INTAGLIO PRINTING PLATE MANUFACTURE

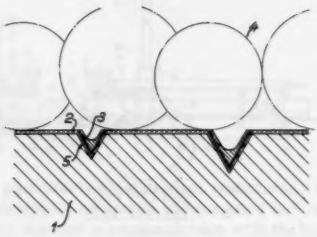
Gualtiero Giori, Lonay, Switzerland, assignor to De La Rue Giori S.A., Switzerland

Filed July 28, 1975, Ser. No. 599,789

Claims priority, application Switzerland, July 30, 1974, 10442/74

Int. Cl.² B41M *1/10*; B24B *31/06*; G03F *7/10*

U.S. Cl. 101—170 **9 Claims**



1. A process for manufacturing an intaglio printing plate for offset printing comprising the steps of:

providing a plate having a surface with non-printing surface areas and engraved printing grooves for copperplate impression printing, a layer of a first material which retains a wetting agent to become ink repellent on said non-printing surface areas,

applying over all of the surface of said plate including the engraved grooves a 0.01 to 0.1 mm thick layer of a second material which is hardenable and has ink accepting properties and which adhers strongly to the plate and partly fills the engraved grooves with said second material to define concave recesses of a depth and form for offset printing, said second material being a synthetic resin base varnish,

hardening said layer of said second material, and thereafter

mechanically removing said second material from the non-printing surface areas of the plate outside of said grooves and simultaneously polishing edges of said second material, in said engraved grooves, flush with said non-printing surface, while leaving intact said layer of said first material on the non-printing surface areas and said second material within said grooves.

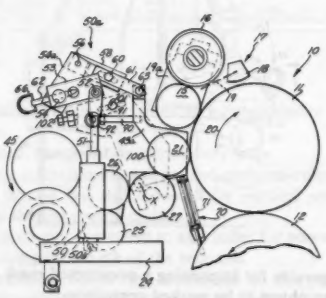
4,036,131
DAMPENER

Donald Fenton Elmore, Xenia, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Sept. 5, 1975, Ser. No. 610,735

Int. Cl.² B41F *13/24*

U.S. Cl. 101—247 **7 Claims**



1. Apparatus for use in a lithographic printing press having

a plate cylinder for carrying a printing plate and an inker having at least one ink form roll for applying ink to the printing plate, said apparatus comprising a dampener form roll for applying dampening solution to the printing plate, said dampener form roll having a thrown-on position for transferring dampening solution to a plate, a thrown-off position out of dampener solution transferring relationship with a plate and a wash-up position in fluid-transmitting relation with an ink form roll of the inker, a throw-off mechanism for moving said dampener form roll between said thrown-on and thrown-off positions including a motor and a linkage mechanism interconnecting said motor and said dampener form roll, means in said linkage mechanism for selectively connecting or disconnecting said linkage mechanism, and at least one spring for moving said dampener form roll to said wash-up position upon disconnection of said linkage mechanism.

4,036,132

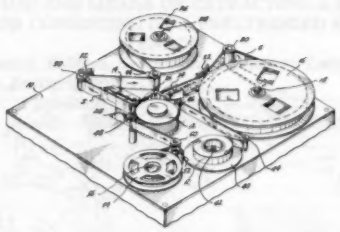
LABEL STRIPPING APPARATUS FOR LABEL PRINTERS

Larry P. Ellefson, Seattle, Wash., assignor to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Nov. 13, 1975, Ser. No. 631,743

Int. Cl.[2] B41F *1/08*

U.S. Cl. 101—288 **9 Claims**



1. A label-stripping apparatus for use with label stock comprising an elongated strip of label stock backing having a front surface and a back surface and further comprising a plurality of labels removably adhering to and spaced along the front surface of the elongated strip, said apparatus including:

a. first means having a label stripping surface capable of causing the labels to separate from the front surface of the elongated strip of label stock backing when the back surface thereof is moved across said label stripping surface in a longitudinal direction of the elongated strip,

b. second means for moving the elongated strip of label stock backing under substantially uniform tension from a supply position to a take-up position and located with respect to said first means so that the back surface of said elongated strip of label stock backing is pressed against said label stripping surface and the elongated strip of label stock backing is caused to travel in a first direction from said supply position to said label stripping surface, across said label stripping surface, and in a second direction, angularly disposed substantially 90° from said first direction, from said label stripping surface to said take-up position,

c. said first means further including a backing pressure surface which is located between said label stripping surface and said take-up position in proximity to said label stripping surface for engaging the front surface of the elongated strip of label stock backing after the elongated strip travels across said label stripping surface, said backing pressure surface being substantially tangent to the portion of the elongated strip between the label stripping surface and the take-up position in said second direction and being spaced from said label stripping surface in said second direction by an amount so as to result in a substantially constant length of the elongated strip of label stock backing being maintained at all times between said supply position and said take-up position.

4,036,133

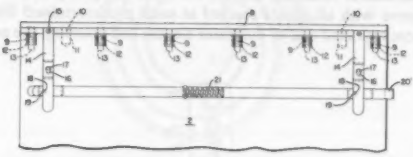
PRINTING PLATE CLAMPING ASSEMBLY

Alex Kocsis, Granger, Ind.; Gerald Kasner, Union, Mich.; Rudy Fermi, South Bend; David Bratton, Mishawaka, both of Ind., and John Pickard, San Antonio, Tex., assignors to K & F Manufacturing Company, Inc., Granger, Ind.

Filed Dec. 12, 1975, Ser. No. 640,169

Int. Cl.[2] B41F *27/12*

U.S. Cl. 101—415.1 **13 Claims**



1. Apparatus for releasably clamping a plate edge portion of thin flexible printing plate to press cylinder means with said printing plate supported in an in-use printing position on a circumferential surface of said press cylinder means; said apparatus including:

clamp members movable between a clamping position with said clamp member means clampingly engaged in plate detent means of said plate edge portion and a non-clamping position out of clamping engagement with said plate detent means,

biasing means for biasing said clamp members means toward said clamping position,

clamp member retaining means movable between a retaining position lockingly retaining said clamp member means in said non-clamping position against the force of said biasing means and a non-retaining position permitting said clamp member means to move toward said clamping position,

and retainer release means for accommodating selective manual movement of said retaining means from said retaining position to said non-retaining position,

said clamp member retaining means including a retaining strap member attached to and movable with said clamp member means and extending in a generally circumferential direction when in an in-use position on a press cylinder means, said restraining strap member including strap member means,

said retainer release means including a release bar extending transversely to said retaining strap member and having release bar detent means,

said release bar being movable between a locking position with said release bar detent means engaged with said strap member detent means to hold said clamp member means in a non-clamping position and a release position with said release bar detent means released from said strap member detent means to permit movement of said retaining strap member and said clamp member means toward the clamping position.

4,036,134

SYMBOL INDICATION DRUM

Takashi Funaki, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Division of Ser. No. 410,336, Oct. 29, 1973, abandoned. This application June 11, 1975, Ser. No. 585,772

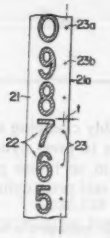
Claims priority, application Japan, Nov. 4, 1972, 47-127312[U]

Int. Cl.[2] B41M *1/40*; G01D *13/12*

U.S. Cl. 101—426 **3 Claims**

1. In a method of manufacturing a drum having indicia

transferred onto its periphery from an inked master by preparing a relatively elongated master by providing thereon a series of inked indicia in correctly positioned longitudinal relation to each other and each having a lateral edge spaced the same predetermined distance from a reference lateral edge of the master, and rolling a drum longitudinally of the master with a selected axial end thereof coincident with such reference edge to transfer the inked indicia onto the cylindrical periphery of the drum as printed indicia; the improvement comprising the steps of providing a cylindrical tester sleeve of transparent material having an internal diameter slightly greater than the external diameter of the drum; marking a circumferentially continuous reference line on the inner periphery of the tester sleeve with all points thereof at such predetermined distance from one axial end of the tester sleeve; and inserting the printed



drum into the tester sleeve with the selected axial end of the drum flush with such one axial end of the tester sleeve to check whether such lateral edges of the printed indicia coincide with such continuous reference line; whereby, by virtue of such circumferentially continuous reference line, all such lateral edges of the printed indicia can be checked simultaneously for such predetermined distance from such selected axial end of the drum without the necessity of effecting relative rotation of the tester sleeve and the drum; further including the step of providing the master with inked reference points each located adjacent a respective indicia, with the reference points being aligned longitudinally of the master and symmetrically located relative to the respective indicia; the inked indicia on the master being essentially centered laterally thereof and the inked reference points being located at such predetermined distance from the reference lateral edge of the master.

4,036,135

OFFSET DUPLICATOR WITH MASTER TREATING MEANS

Hermann Raible, and Rolf Muller, both of St. Georgen, Germany, assignors to Mathias Bauerle GmbH, St. Georgen, Germany

Filed June 23, 1975, Ser. No. 589,026

Claims priority, application Germany, Sept. 30, 1974, 2446608

Int. Cl.[2] B41F 7/00

U.S. Cl. 101—463 **19 Claims**

3. A rotary duplicating machine having a master cylinder and a treating unit for converting a master while the master is being attached to the master cylinder, comprising:

selective means operable to drive the master cylinder at a printing speed and at a starting speed;

feed means for feeding a master to the treating unit;

conveyor means for transporting said master from the treating unit to the master cylinder;

clamping means on the master cylinder for clamping one end of the master to the master cylinder;

said drive means driving the feed means and the conveyor means at a speed to move a master at substantially the same speed as moved by the master cylinder when operating at its starting speed, and

control means for rendering the drive means inoperative when the clamping means clamps one end of the master to the master cylinder.

14. A method of treating a master with a conversion solution while the master is being attached to a master cylinder of a duplicating machine in which the master cylinder is selectively operable at a printing speed and a starting speed, comprising the steps of:

transporting a master to a treating means by feed means operable at the starting speed of the master cylinder;

discontinuing transport of the master by the feed means in response to arrival of one end of the master at conveyor means;

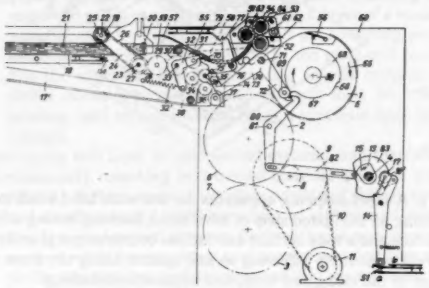
operating the conveyor means for delivering said one end of the master to a clamping means on the master cylinder;

discontinuing the drive of the conveyor means when said one end of the master is clamped to the master cylinder by the clamping means;

operating the master cylinder at the starting speed to draw the master through the treating means while the master is being wrapped around the master cylinder; and

operating the master cylinder at the printing speed when the master is wrapped completely around the master cylinder.

15. A duplicating machine including master clamping means, comprising:



a master cylinder for supporting a master and rotatable selectively at a printing speed and a starting speed;

a cam disc interconnected with the master cylinder and provided with an outer periphery having a first and a second timing surface;

follower means carried by the master cylinder for coaction with the cam disc;

said clamping means being positioned on the master cylinder and operable from an open position for ejecting a master to a closed position for master clamping, and through a master inserting position intermediate the open and closed positions; and

actuator means for operating the clamping means to the open position when the follower means coacts with the first timing surface of the cam disc and for operating the clamping means to the master inserting position when the follower means coacts with the second timing surface of the cam disc,

said actuator means operating the clamping means from the master inserting position to the closed position when the said follower means coacts with the periphery of the cam disc spaced from the first and second timing surfaces.

4,036,136

CORONA PRODUCING A PLANOGRAPHIC PRINTING SHEET

Tohru Takagi, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed Mar. 14, 1975, Ser. No. 558,300

Claims priority, application United Kingdom, Mar. 18, 1974, 49-4929966

Int. Cl.² H01T *19/00*

U.S. Cl. 101—467 2 Claims

1. A method for producing a planographic printing plate or sheet which is characterized in that the surface of an oleophilic body comprising an oleophilic resin is subjected to a corona discharge treatment to form a hydrophilic layer on said surface, wherein said olephilic resin is polybutadiene, said corono discharge is the discharge of a sinusoidial AC voltage of 3 kHz frequency and 15,000 volts at a current of 1.8 amps, and wherein not less than 0.05 milliwatt hour of discharge current is applied to each 1 cm^2 of the surface of said body, whereby the wettability of said surface is increased.

4,036,137

METHOD AND MEANS OF EXTRACTING A SOIL ANCHOR CONSISTING OF A PRESTRESSED STEEL TENDON

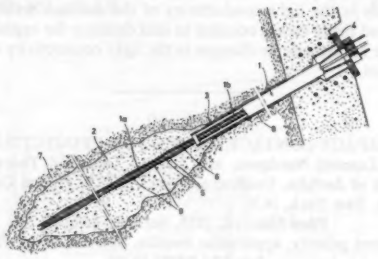
Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG of Bern, Switzerland

Filed June 13, 1975, Ser. No. 586,801

Claims priority, application Switzerland, June 19, 1974, 8424/74

Int. Cl.² F42D *1/00*

U.S. Cl. 102—23 2 Claims



1. A method of extracting a ground anchor embedded in the ground and including a prestressed tendon having a confinement member and a stressed member, said confinement member extending to the bottom of a borehole in the ground in which the anchor was introduced and bonded therein by a hardening agent injected into the borehole and surrounding and bonded to the confinement member, said stressed tension member extending through an encasing tube to an anchor plate at the entry of the borehole, whereby a hollow loading tube was placed substantially centrally and longitudinally of substantially the entire length of said tendon and introduced simultaneously with the anchor into said borehole, the improvement comprising:

A. introducing an explosive into the last-mentioned tube along the entire length of the confinement member;

B. detonating the explosive and rupturing the hardened agent surrounding the confinement tube and loosening the bond with the confinement member; and

C. withdrawing the loosened tendon out of the soil in which the anchor was embedded.

4,036,138

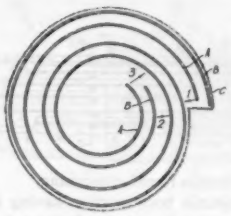
RIGID WATERPROOF CONTAINER FOR SLURRIED EXPLOSIVES IN SMALL DIAMETERS

Gopal Mohan Chopra; Tyagaraja Gangadharan, and Ram Narain Sinha, all of Bihar, India, assignors to Indian Explosives Limited, India

Filed Dec. 17, 1975, Ser. No. 641,456

Int. Cl.² F42B *3/00*

U.S. Cl. 102—24 R 8 Claims



1. A waterproof and rigid container for slurried explosives which comprises a tube or shell formed by superimposing partially or wholly a shrinkable film on paper and rolling the film and paper into the shape of a tube or shell of continuous and successive layers of the film and paper, the inner layer being the film and the outer layer being the paper, and thereafter crimping the tube or shell at one end, the tube or shell so formed being externally coated with a suitable waterproofing medium under predetermined conditions thereby causing a partial shrinkage of the film and, when required, the waterproofed tube or shell is filled with an explosive and the filling or mouth end is crimped and waterproofed forming a rigid and waterproof cartridge.

4,036,139

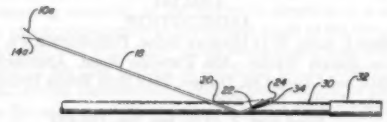
ELECTRICALLY INITIATED FUSE IGNITOR

Robert Edward Eckels, 2101 Youngfield, Golden, Colo. 80401

Filed Jan. 9, 1976, Ser. No. 647,661

Int. Cl.² C06C *5/06*

U.S. Cl. 102—28 R 10 Claims



1. An electrically initiated pyro-detonation cap assembly resistant to static electricity comprising:

a. a length of fuse means of the ignition type having an ignition train;

b. a pyro-detonation cap secured to an end of said fuse means;

c. a cut in said of fuse means exposing the ignition train therein;

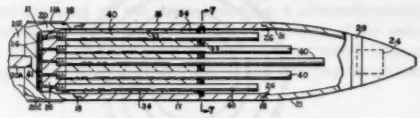
d. a pyro-alloying, conducting bridgewire mounted in said cut essentially in contact with said ignition train, said bridgewire comprising a pyro-alloying composition which is not a resistance wire, and

e. an electrical lead secured to and extending from each end of said bridgewire to an electric current source, arranged to activate the alloying reaction of said bridgewire and ignite said fuse ignition train.

4,036,140
AMMUNITION

Abraham L. Korr, Philadelphia, Pa.; Evan Harris Walker, Aberdeen, Md.; Charles M. Dickey, Huntingdon Valley, and Bransby W. Bushey, Philadelpia, both of Pa., assignors to The United States of America as represented bythe Secretary of the Army, Washington, D.C.

Filed Nov. 2, 1976, Ser. No. 737,925
Int. Cl.[2] F42B *5/02*
U.S. Cl. 102—38 **6 Claims**

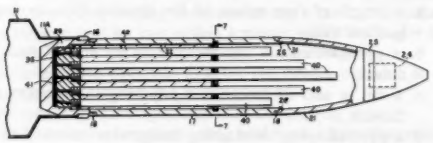


1. An ammuniton round comprising,
a main projectile body portion having a tubular sidewall rearwardly terminating in a base portion,
a boom extending rearwardly from said base portion and terminating in a plurality of canted stabilizing fins,
a cartridge case secured to said projectile body portion, said cartridge case containing a primer and housing said boom,
a plurality of sequentially initiatable traveling charges surrounding said boom and intermediate said base portion and said primer,
an ignition delay element intermediate longitudinally successive ones of said traveling charges,
a forward ogive portion connected to said sidewall and having a forwardmost nose member containing fuze means,
an ogival ejection element carried by a rearward portion of said ogive portion,
ignition means interconnecting said ogival ejection element with said fuze means,
a plurality of launch tubes secured in said projectile main body portion, each launch tube carrying a plurality of fin stabilized sub-projectiles and means including a primer and traveling charges for launching the corresponding fin stabilized sub-projectiles from the respective launch tube,
an initiator secured in said base portion, and
ignition means interconnecting said initiator with said ogival ejection element and each of said launch tube primers.

4,036,141
AMMUNITION

Abraham L. Korr, 8712 Hickory Drive, Philadelphia, Pa. 19136; Evan Harris Walker, 834 Paradise Road, Aberdeen, Md. 21001, and Charles M. Dickey, 3549 Brae Bourn Drive, Huntingdon Valley, Pa. 19006

Filed Aug. 2, 1976, Ser. No. 710,493
Int. Cl.[2] F42B *9/02*
U.S. Cl. 102—38 **9 Claims**

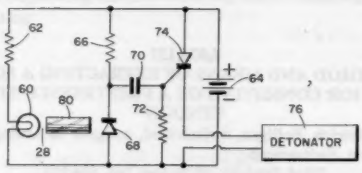


1. In an ammunition round having a projectile secured in a mouth of a cartridge case, said case having means for operatively launching said projectile,
said projectile having a main body portion and a forward ogive portion, said ogive portion having a forwardmost nose member containing fuze means,
an ogival ejection element carried by a rearward portion of said ogive portion,
ignition means interconnecting said ogival ejection element with said fuze means,
a plurality of launch tubes secured in a base support positioned in said projectile main body portion, each launch tube carrying a plurality of sub-projectiles, a rearmost primer, and a plurality of sequentially initiated traveling charges intermediate said sub-projectiles and said primer,
an initiator secured in a base portion of said projectile main body portion, and
ignition means interconnecting said initiator with said ogival ejection element and each of said launch tube primers.

4,036,142
OBSCURATION FUZE AND SENSOR

David Williams, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 18, 1967, Ser. No. 610,204
Int. Cl.[2] F42C *13/02, 19/12, 11/00*
U.S. Cl. 102—70.2 R **10 Claims**

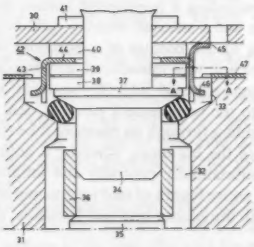


1. An obscuration fuze comprising means defining a sensing gap, a light source coupled to said means for directing light across said gap, a detector coupled to said means for sensing changes in the light conductivity of the medium within said gap, and firing means coupled to said detector for exploding a charge in response to changes in the light conductivity of said medium.

4,036,143
IMPACT CONTACT DEVICE FOR PROJECTILES

John Lennart Nordgren, and Gunnar Gudmund Thordarson, both of Jarfalla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,087
Claims priority, application Sweden, Mar. 26, 1975, 7503490
Int. Cl.[2] F42C *19/06*
U.S. Cl. 102—70.2 R **4 Claims**



1. An impact contact device in an ignition tube adapted to be mounted on the nose part of a projectile, the tube including a rigid nose part and a rigid base part, comprising a rotational joint for mechanically holding together said nose and base parts so as to allow relative rotation of the two parts, said rotational joint being dimensioned so as to have a mechanical

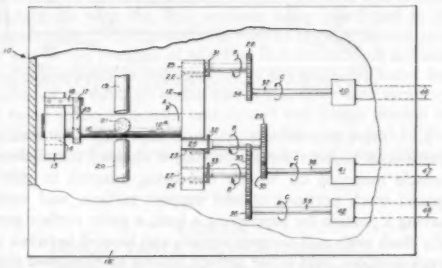
strength such that it yields due to resilience or a break when exposed to given forces which appear upon lateral impact of the projectile against a target, contact means arranged at the interface area between the two parts and responsive to a relative motion, in a lateral or axial direction, between the two parts for operating an ignition circuit when said relative motion exceeds a certain value, a portion of the base part that faces the nose part comprising a metallic plate having a central aperture and forming a mechanical barrier between the two parts and an electric ground for the ignition circuit, said contact means comprising a first contact element supported by the nose part and including a generally sleeve-shaped metallic body which projects from the nose part into a recess in said metallic plate, said contact means further comprising a second contact element supported by the base part and electrically connected to the metallic plate and normally positioned at a distance from the first contact element but arranged to come into contact with the first contact element upon relative motion between the nose and base parts thereby to operate said ignition circuit, a conductor extending through said central aperture for interconnecting the nose part and the base part and surrounded by the sleeve-shaped body, said recess in the metallic plate comprising a widened portion of the central aperture which is situated at the surface of the metallic plate that faces the nose part.

4,036,144

ARMING SYSTEM

James M. Meek, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 29, 1959, Ser. No. 790,028
Int. Cl.² F42C *15/40*
U.S. Cl. 102—70.2 R **4 Claims**



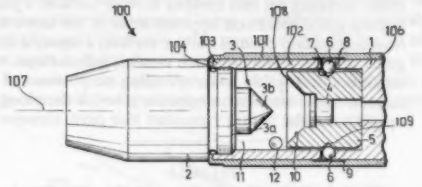
1. An arming system for use in an ordnance missile, said system consisting of two parts contained within said missile and electrical wiring connections for transmitting electrical signals therebetween, the first part comprising: an arming rotor, a spring biasing said rotor for rotation to an armed position, means for locking said rotor against rotation to said armed position, said means adapted to unlock said rotor for rotation when said means receives a series of electrical signals of predetermined duration in a predetermined sequence from said electrical wiring connections; the second part comprising: a series of environmental sensing switches each adapted to close in response to a predetermined condition which the missile experiences during proper missile flight, a distributor, contacts adapted to be closed by said distributor in a predetermined sequence and for predetermined time periods, and a source of electrical power connected to said contacts and to said electrical wiring connections so that said series of electrical signals is applied to said electrical wiring connections.

4,036,145

PERCUSSION FUSE ASSEMBLY

Willi Luebbers, Trittau, Germany, assignor to Nico-Pyrotechnik Hanns-Juergen Diederichs KG., Trittau, Germany

Filed June 4, 1976, Ser. No. 693,001
Claims priority, application Germany, June 19, 1975, 2527339
Int. Cl.² F42C *1/04*
U.S. Cl. 102—73 R **2 Claims**



1. In an explosive munitions shell disposed in a cartridge separable upon firing of the shell and having a charge-containing shell body and a shell head disposed forwardly of and in spaced relation to the shell body, an improved percussion fuse assembly which comprises, in combination, a fuse body interconnecting the shell body and the shell head, the fuse body having a fixed sleeve portion containing at least one radial bore therethrough, an impact member lockably supported for axial movement in the sleeve portion between a rearmost rest position and a frontmost impact position, the impact body having an annular groove disposed in the periphery thereof in radial alignment with the first bore of the sleeve member when the impact member is in its rearmost position, a first blocking sphere seatable in the aligned first bore and peripheral groove to normally prevent substantial forward motion of the impact member, the impact member having a first frusto-conical inwardly and rearwardly extending central recess in the front surface thereof and a percussion cap disposed adjacent the rear end of the first recess, a second sphere carried in the fuse body and disposed in the first recess of the impact member during an acceleration of the shell, the second sphere being movable inertially and forwardly from the first recess and along the inner wall of the sleeve portion during a deceleration of the shell, and a firing pin centrally disposed in and extending rearwardly from the rear surface of the shell head and engageable with the percussion cap when the impact member is in its frontmost position, the firing pin having a front cylindrical portion and a rear conical portion abutting the front portion and tapering inwardly in the rearward direction at a conical angle which corresponds to the conical angle of the first recess, the internal wall of the first recess being larger than the external wall of the rear portion of the firing pin for clamping the second sphere therebetween upon a deceleration of the shell while the second sphere is disposed within the first recess, the wall of the front cylindrical portion of the firing pin defining, with the wall of the sleeve portion, a second annular recess disposed in the normal path of inertial movement of the second sphere during a deceleration of the shell for receiving the second sphere.

4,036,146

PASSENGER TRANSPORTATION SYSTEM

Philranzo Tyus, 225 S. Witmer No. 104, Los Angeles, Calif. 90026

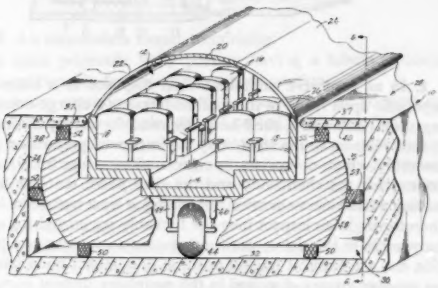
Filed Nov. 19, 1975, Ser. No. 633,247
Int. Cl.² B61B *13/00*
U.S. Cl. 104—1 R **6 Claims**

1. A passenger transportation system comprising:
an elongated conduit having a generally rectangular-shaped hollow interior defining a bottom wall surface, spaced apart upright side wall surfaces above the conduit bottom surface, and an upper wall surface above the side walls

and spaced from the conduit bottom surface, each wall surface being substantially flat from end-to-end, and an elongated opening in the upper wall surface extending continuously along the length of the conduit;

a transport vehicle in the conduit for being transported lengthwise through the conduit;

a suspension system comprising a series of longitudinally spaced apart rigid carrier frames secured to the transport vehicle to support the transport vehicle above the conduit bottom surface, each carrier frame supporting a drive roller traveling on said conduit bottom surface, a pair of bottom guide rollers on opposite sides of the drive roller traveling on said conduit bottom surface, a separate lateral guide roller traveling on each conduit side surface, and a separate upper guide roller traveling on portions of said conduit upper surface on opposite sides of the elongated opening therein;



each carrier frame further supporting a respective biasing means engaged with each roller to urge the drive roller and bottom, lateral, and upper guide rollers outwardly into pressure contact with their respective conduit wall surfaces so as to maintain the transport vehicle centered in the conduit cross-section during transit of the vehicle lengthwise in the conduit, the upper guide rollers extending upwardly into contact with the conduit upper surface portions on opposite sides of the transport vehicle;

the transport vehicle having an elongated interior section for carrying passengers, an upper portion of said interior section projecting through the opening in the conduit continuously along the length of said interior section, and door means in the projecting upper portion of the vehicle for allowing access to the vehicle interior.

4,036,147

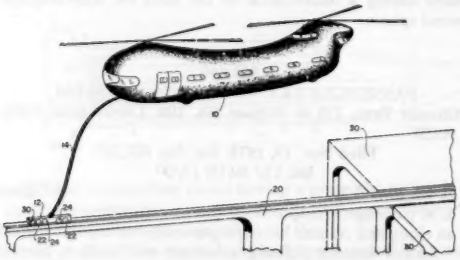
RAPID TRANSIT SYSTEM

Wayne A. Westling, 1530 21st St., Manhatten Beach, Calif. 90266

Continuation of Ser. No. 562,831, March 28, 1975, abandoned. This application June 23, 1976, Ser. No. 698,940

Int. Cl.[2] B64F *3/02*

U.S. Cl. 104—23 R **1 Claim**



1. A transit system comprising: an elongated structure mounted at an elevation above the ground and including a pair of spaced parallel electrically energized rails electrically insulated from one another; a trolley positioned on said structure for movement along the rails and including a first wheel engaging one of the rails and a second wheel insulated from the first wheel and engaging the other of said rails; an electrically energized aircraft of the helicopter type; and a retractable electric cable extending from the trolley to the aircraft and electrically connected to the first and second wheels to supply electric power to the motors of the aircraft and constituting the sole coupling between the elongated structure and the aircraft, in which the rails are positioned one above the other, in which the first and second wheels respectively engage the under surfaces of the rails, and in which the trolley includes a third wheel which engages the upper surface of the upper rail.

4,036,148

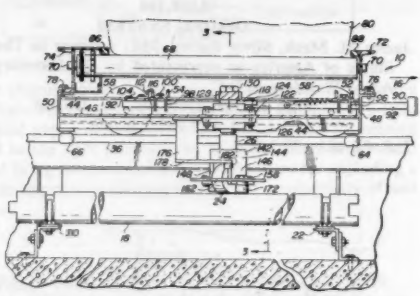
VEHICLE AND TRACK SYSTEM

Vercoe C. Jones, and Robert A. Hale, both of Easton, Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Nov. 6, 1975, Ser. No. 629,242

Int. Cl.[2] B61B *13/12*

U.S. Cl. 104—166 **16 Claims**



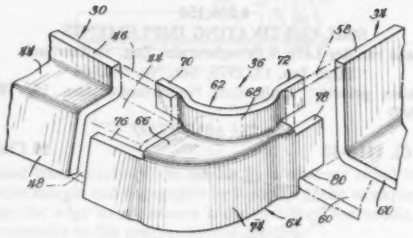
1. A driverless vehicle system comprising a substantially continuous support surface having a channel therebelow, a vehicle mounted on wheels and being adapted to ride on spaced track portions of said support surface, said vehicle having a portion for supporting a load, a guide surface generally flush with said support surface and located between said track portions, said guide surface having an elongated slot in said support surface, an elongated drive shaft means mounted for rotation within said channel and being substantially parallel with said slot, said vehicle including a drive wheel means on the bottom side thereof, said drive wheel means extending downwardly through said slot and including a drive wheel in said channel, said drive wheel being oscillatable about an upright axis and rotatable about a horizontal axis, the periphery of said drive wheel contacting the periphery of said drive shaft means, a control member coupled to said drive wheel for oscillating said drive wheel, said control member being located beneath the level of said support surface and being mounted for oscillation between a vehicle drive position and a vehicle stop position, an actuator means at spaced locations beneath said support surface for selectively oscillating said control member about said upright axis to cause said vehicle to stop, said actuator means being movable between an operative position wherein it can engage said control member for oscillating the same and an inoperative position wherein it cannot engage said control member.

4,036,149

FABRICATED HOPPER CAR OUTLET DOOR FRAME

Clarence E. White, Kenosha, Wis., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed Aug. 4, 1975, Ser. No. 601,921
Int. Cl.[2] B61D 7/02, 7/22; F16B 1/00, 5/07
U.S. Cl. 105—280 12 Claims



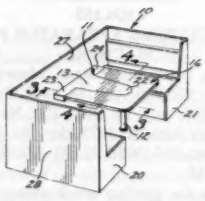
1. A fabricated hopper outlet door frame comprising an upper frame member; a pair of side frame members respectively secured at their one ends to the ends of said upper frame member, said side frame members comprising inner and outer leg portions and a web which are positioned in an approximately Z-configuration as viewed in cross section; a lower frame member extending between the other ends of said side frame members; and a pair of corner fittings respectively interconnecting said other ends of said side frame members and the adjacent ends of said lower frame member, each of said corner fittings including a first generally axially outward radially inner wall section comprising an intermediate wall portion and having first and second end flange portions lying in perpendicular planes, a second generally axially inward radially outer wall section comprising an intermediate wall portion and having at least a first end flange portion generally radially spaced from said first end flange portion of said wall section, and an intermediate wall section integral with said first and second wall sections with the wall sections being positioned in an approximately Z-configuration as viewed in cross section, said first end flange portions of said first and second wall sections being respectively in juxtaposition to the inner and outer leg portions of the adjacent end of one of said side frame members and being secured thereto, said second end flange portion of said first wall section being in juxtaposition to a part of the adjacent end of said lower frame member and being secured thereto.

4,036,150

DINING TABLE SERVICE ASSEMBLY

Joseph C. Algier, 3437 Procyon Ave., Las Vegas, Nev. 89114

Filed June 14, 1976, Ser. No. 695,476
Int. Cl.[2] A47B 35/00
U.S. Cl. 108—50 10 Claims



1. A dining table service assembly for providing food to seated patrons comprising:

a. a stationary dining table segment secured in place between seating positions and having a tongue extending longitudinally between said seating positions with a laterally expansive horizontal top terminating in contoured edges with subjacent surfaces for supporting a weight from above,

b. a mobile serving cart carrying a table segment support having laterally spaced supporting members,

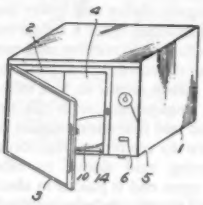
c. a separate removable dining table segment having longitudinally extending arms with expansive horizontal upper surfaces terminating in edges formed in a contour to mate with the aforesaid contour of said edges of said tongue and spaced for lateral engagement with the aforesaid tongue to rest on and bear down against said subjacent surfaces, said removable table segment being positionable to removably engage said stationary table segment with the top of said tongue and the upper surfaces of said arms, lying in a common horizontal plane, and also being positionable to be removably supported on said table segment support separate from said stationary dining table segment.

4,036,151

MICROWAVE COOKING APPARATUS WITH TURNTABLE

Yasuo Shin, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 362,217, May 21, 1973, abandoned.
This application June 26, 1975, Ser. No. 590,512
Claims priority, application Japan, May 26, 1972, 47-63713[U]
Int. Cl.[2] A47B 85/00
U.S. Cl. 108—20 4 Claims



1. A turntable for use in a microwave oven, made of a low dielectric loss inorganic material such as glass and ceramics and adapted to rotate a foodstuff mounted thereon at the base portion of said microwave oven during cooking, said turntable being removably engaged with the base of the microwave oven and comprising:

a raised edge provided at the peripheral portion of the upper surface thereof and serving as a drain for collecting the liquid ingredients from the foodstuff; a connection provided on the turntable and removably engaged with a source of driving force for rotating said turntable, said engagement providing a pedestal for rotation of said turntable; and one or more legs provided at the lower surface thereof for stabilizing the turntable when positioned on a level surface, whereby said turntable, because of its removable engagement with the driving source, functioning as a foodstuff supporter within the oven and as a tableware when the turntable is removed from the oven.

4,036,152

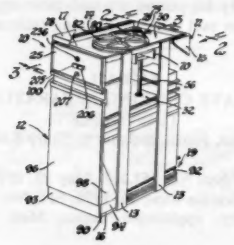
REFUSE COMPACTOR-INCINERATOR DISPOSER

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,494
Int. Cl.[2] F23G 5/10
U.S. Cl. 110—8 E 4 Claims

1. A refuse compactor-incinerator appliance comprising a housing including a top and a base, an upper horizontally disposed partition spaced below said top dividing said housing into an upper drive chamber and a lower drawer space,, means for supporting a top insulation wall subjacent said partition for

vertical movement, first spring means biasing said top wall in a downward direction, a lower insulation wall supported on said base, ram means including a ram plate mounted in said drawer space for vertically reciprocal movement, ram drive means in said drive chamber including means for vertically extending said ram plate into the drawer space and retracting said plate to an elevated position whereby said first spring means are compressed, electric motor means in said drive chamber having a driving connection with the drive means in said drive chamber for actuation of said ram means, means for supporting a drawer assembly on said housing for movement between a compacting-incinerating position in said housing and a position disposed outwardly of said housing, said drawer assembly including an open-ended insulated sleeve carried thereon, second spring means normally resiliently supporting said insulated sleeve a defined distance above said lower insulation wall and below said upper insulation wall, a refuse receptacle carried within said sleeve adapted to receive said ram plate, said ram plate when driven downwardly a predetermined distance allowing said first spring means to bias said upper insulation wall into abutting engagement with the upper end of said insulated sleeve, and said first spring means being of sufficient predetermined force to overcome the force of said second spring means causing said sleeve to move downwardly whereby its lower open end is placed in abutting engagement with said lower wall thereby defining an insulated combustion chamber.

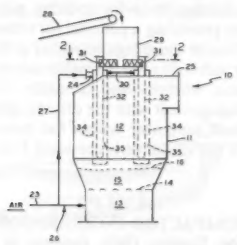


4,036,153

FLUID BED INCINERATOR FEED SYSTEM

Robin Gustav Nauta, Woodbury, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed July 3, 1975, Ser. No. 592,977
Int. Cl.[2] F23G *5/00*
U.S. Cl. 110—8 F **4 Claims**



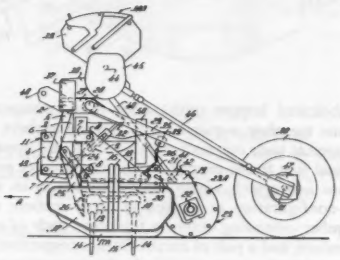
1. A fluid bed unit comprising a reaction chamber, a windbox separated from said reaction chamber by a constriction plate, a body of particulate solids subject to fluidization on said constriction plate, air supply means for introducing fluidizing air into said windbox, vertically disposed feed means for conducting feed into said reaction chamber, said feed means extending into said reaction chamber through the top of said fluid bed unit and terminating close to and above the level of the fluidized body of particulate solids in said reaction chamber and at least one secondary air supply pipe surrounding and concentric with said feed pipe but spaced therefrom so that an annular air passage is provided between said pipes for downwardly discharging a secondary air supply into said reaction chamber at a level close to and above, but directed toward, the fluidized body of particulate solids.

4,036,154

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed Jan. 13, 1975, Ser. No. 540,444
Claims priority, application Netherlands, Jan. 18, 1974, 7400690
Int. Cl.[2] A01B *33/00*
U.S. Cl. 111—10 **10 Claims**



1. A rotary harrow having a frame, said frame comprising a first and forward frame portion with coupling means for coupling said implement to a prime mover and a second, elongated frame portion located to the rear of said first frame portion, said second frame portion extending transverse to the direction of travel and a row of soil-working members being mounted on the second frame portion, drive means connected to rotate said soil-working members about upwardly extending axes, ground-engaging supporting roller means adjustably interconnected to the second frame portion at the rear thereof to control the working depths of said soilworking members, ground-engaging supporting wheel means being pivotably interconnected to an upper part of said first frame portion by rearwardly extending arm means and said wheel means providing additional support for the implement, said arm means being pivotably upwardly and downwardly relative to the first frame portion to change the amount of additional support for said implement, setting means linking said arm means to a lower part of said first frame portion and retaining said wheel means in a chosen supporting position relative to said first frame portion, said first and second frame portions being linked to one another and vertically displaceable with respect to one another during operation.

4,036,155

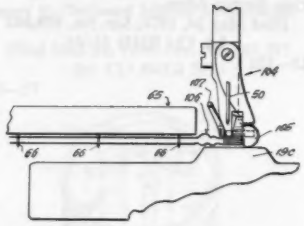
AUTOMATIC GUIDING APPARATUS FOR SEWING MACHINE

Ernest M. Junkins, 121 Wheeler Road, Monroe, Conn. 06468

Division of Ser. No. 850,950, Aug. 18, 1969, Pat. No. 3,683,831, and Ser. No. 280,107, Aug. 14, 1972, Pat. No. 3,901,172. This application June 25, 1975, Ser. No. 590,318
Int. Cl.[2] D05B *21/00, 35/10*
U.S. Cl. 112—121.15 **7 Claims**

1. An apparatus for guiding work along a predetermined path with respect to a sewing machine having a needle to form a line of stitching substantially corresponding to the path and positioned a precise margin from the edge of the work comprising a work holder for holding the work, drive means for causing the work holder to move the work at the needle along the normal feed path to the needle, means for supporting the

work holder to normally space the edge of the work at the needle transversely beyond the needle a distance that is greater than the precise margin and guide means having a surface



spaced transversely of the needle by a distance equal to the precise margin and engageable by the edge of the workpiece to force the edge to a distance transversely of the needle that corresponds to the precise desired margin.

4,036,156

DEVICE FOR SEWING TOGETHER PLIES OF MATERIAL ADJUSTED TO EQUAL LENGTHS

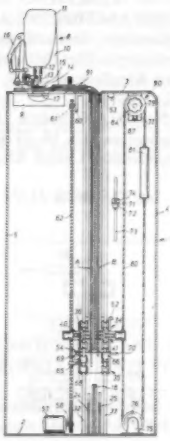
Dietmar Becker, Kaiserslautern; Fritz Jehle, Enkenbach-Alsenb.; Rubi Schonthaler, Kaiserslautern, and Erich Willenbacher, Karlsruhe, all of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Dec. 2, 1975, Ser. No. 636,995

Claims priority, application Germany, Dec. 12, 1974, 2457535; Oct. 11, 1975, 2545685

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.26 **10 Claims**



1. In a sewing unit including a sewing machine, a device for automatically adjusting two plies of material, which are to be sewn together by the sewing machine and which register with each other at their leading edges, to mutually equal lengths and to maintain their trailing edges in fixed relation to each other during the sewing operation, said device comprising, in combination, a relatively elongated intermediate plate separating the two plies in advance of the sewing machine; respective clasps, adjacent opposite surfaces of said intermediate plate, selectively engageable with the adjacent ply of material; means mounting said clasps for movement in the feed direction of the plies by engagement with the respective adjacent plies; respective sensing means operatively associated with each ply of material and each operable to sense the trailing edge of the associated ply; means operable, responsive to sensing of the trailing edge of an associated ply by the respective sensing means, to effect engagement of the respective clasp with the associated ply of material for movement therewith; a structural part interconnecting said clasps; and means, including said structural part, operable to exert a pull on the plies of material in a direction opposite to the feed direction of the plies of material.

4,036,157

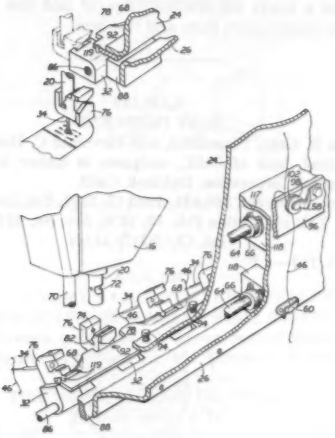
AUTOMATIC THREAD CHANGER

Alfred D. Sacchetti, 1903 Sharon Road, Meadowbrook, Pa. 19046

Filed Dec. 10, 1975, Ser. No. 639,569

Int. Cl.[2] D05B *1/08*

U.S. Cl. 112—163 **10 Claims**



1. An automatic thread changer for use in connection with a continuous stitching sewing machine having a non-rotating, non-translatory vertically reciprocating needle bar assembly which includes a needle bar, said automatic thread changer comprising a plurality of threaded needles each extending from a needle holder, means for detachably securing said needle bar with any one of said needle holders, and means to move said needle holders one by one sequentially into positive attachment but detachable connection with said needle bar assembly to form a temporary but solid needle bar assembly comprising said needle bar, one of said needle holders and its associated needle, for use in continuous stitching with a selected first one of said needle holders and needles whereby said first needle holder may be detached from said needle bar assembly and a second needle holder brought into operative but detachable connection with said needle bar assembly for use in continuous stitching.

4,036,158

SEWING MACHINE

Marcel Fresard, Petit-Lancy, Geneva; Olindo Baruffa, Thonex, Geneva, and Jean-Pierre Gabriel, Veyrier, Geneva, all of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

Filed May 10, 1976, Ser. No. 684,938

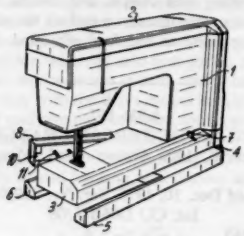
Claims priority, application Switzerland, May 16, 1975, 6367/75

Int. Cl.[2] D05B *75/00*

U.S. Cl. 112—258 **12 Claims**

1. In a sewing machine having a frame including a column, said column including a base, an upper arm and a free arm carried by said column, two longitudinal supports disposed on either side of said free arm, the improvement comprising guide means connecting said supports to said base means carried by

said base and cooperating with said support connecting means for moving each of said supports laterally between a position



adjacent a lower longitudinal edge of said free arm and a position spaced apart from said free arm.

4,036,159

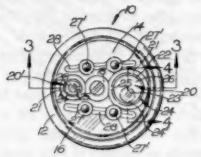
EASY OPEN END

Gordon R. Gane, Pleasanton, and Lawrence C. Hoffmann, Jr., Oakland, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Division of Ser. No. 586,671, June 13, 1975, Pat. No. 3,967,751. This application Feb. 10, 1976, Ser. No. 657,013

Int. Cl.² B21D *51/44*

U.S. Cl. 113—1 F **22 Claims**



1. A method for producing an easy open closure member having at least one depressible tab comprising the steps of selecting a closure blank of ductile metal and provided with a main panel and an outer peripheral reinforcing rib, initially working and subjecting a portion of the panel closer to the center of the panel than to said rib and at least one additional portion of the panel located intermediate a predetermined part of the said rib and first mentioned portion of the panel to selective drawing pressures and forming an embossment in said first mentioned panel portion and an unsymmetrical outwardly disposed dimple in said second mentioned panel portion while locating the central vertical axis of the dimple at a predetermined point on the panel, then while controlling the flow of the metal making up the dimple restructuring the dimple by expanding the dimple outwardly into a confined opening and while relocating the central vertical axis of the dimple, then differentially work hardening and reshaping the metal in the peripheral base of the said dimple and portions of the panel adjacent thereto to complete the formation of the dimple and establish selectively offset concentric inner and outer dimple base sections interconnected by a web, then without producing any material thinning of the portions of the dimple located in the confined opening subjecting said web to compressive forces and materially thinning all but a selected amount of the material in the said web to provide in the web an embrittled thin tear line portion and a sector thereof more work hardened than other sectors of said tear line portion and during said thinning of the web and forming said tear line portion allowing the terminal ends of the tear line portion to form and recede into a depressible tab hinge portion.

4,036,160

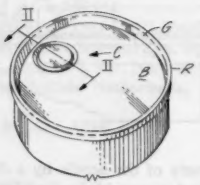
METHOD OF MAKING WEAKENING LINES IN SHEET METAL

John Sherburne Kelley, Wenham, Mass., assignor to USM Corporation, Boston, Mass.

Filed May 24, 1976, Ser. No. 689,642

Int. Cl.² B21D *51/44*

U.S. Cl. 113—121 C **7 Claims**



1. The method of making a digitally disruptable closure in a sheet metal blank comprising, in sequence:

a. bending a portion of the blank out of its plane to provide a closure-defining peripheral wall in the blank,

b. coining the wall periphery lengthwise to score and establish a non-fractured residuum thickness,

c. transversely bending said wall to tension the metal across the residuum thickness until a fractured section characterized by irregular fissures and matching edges is produced therein, and then

d. swaging at least one of the edges of said fractured section to lock the closure disruptably to the remainder of the blank.

4,036,161

UNDERWATER ANCHORING APPARATUS

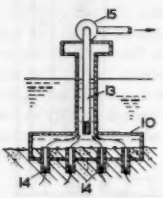
Ralph Alan Nixon, Hamilton, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England

Division of Ser. No. 453,638, March 21, 1974, Pat. No. 3,967,393. This application Feb. 10, 1976, Ser. No. 656,884

Claims priority, application United Kingdom, July 4, 1973, 31935/73

Int. Cl.² B63B *21/27*

U.S. Cl. 114—296 **9 Claims**



1. Underwater anchoring apparatus for establishing a means of anchorage in the bed of a volume of water comprising

a substantially hollow closed structure submersible in the volume of water,

at least two substantially unobstructed intake passageways located in the lower region of said structure, and

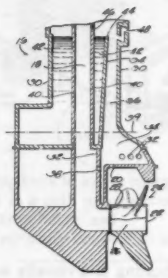
collecting means operative in use to induce into the interior of said structure through said intake passageways water from the lower strata of said volume of water, said water being induced into said interior and carrying with it into said interior solid matter from the waterbed which solid matter settles in said structure to substantially fill said structure and cause the structure to become at least partially buried in said bed of said volume of water.

4,036,162

MARINE PROPULSION DEVICE HAVING INCREASED REVERSE THRUST

Daniel F. Maier, Lake Villa, and John D. Sheldon, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 11, 1976, Ser. No. 685,297
Int. Cl.[2] B63H 5/13
U.S. Cl. 115—17 14 Claims



1. A marine propulsion device comprising an engine having an exhaust port for discharging exhaust gas, and also comprising a lower unit having wall means defining an exhaust passage in communication with said exhaust port, said lower unit also having a propeller, said lower unit also having a cavitation plate located above said propeller and submerged in water during idle engine operation, said lower unit also having an exhaust outlet in communication with said exhaust passage, said exhaust outlet affording discharge of the exhaust gas below said cavitation plate and aft of said propeller, said lower unit also having an outer wall including an outlet, said outer wall outlet being located above said cavitation plate and submerged in water during idle engine operation, said lower unit also having passage means in communication with said exhaust passage and said outer wall outlet, said passage means affording, during reverse engine operation, discharge of a portion of the exhaust gas from said exhaust passage out said outer wall outlet.

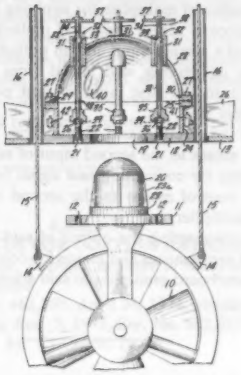
4,036,163

APPARATUS FOR MOUNTING AND DISMOUNTING A SUBMERGED PROPELLER UNIT FOR A FLOATING BODY

Anders Lennart Pehrsson, Kristinehamn, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed June 1, 1976, Ser. No. 691,838
Claims priority, application Sweden, June 6, 1975, 7506470
Int. Cl.[2] B63H 5/12, 5/14
U.S. Cl. 115—34 R 7 Claims

1. Apparatus for mounting and dismounting a submerged propeller unit having a flange adapted to be secured by fastening means on the outside of a flange surrounding an opening formed in an outside wall of a floating body below the waterline, wherein the improvement comprises a watertight enclosure detachably secured inside said body and covering said wall flange and opening, a plurality of means in the wall of said enclosure providing access to the interior thereof from inside the body, and a plurality of tool means extending through said respective access means in watertight relation thereto and operable from a location inside the body and outside the enclosure for adjusting a plurality of fastening means inside the enclosure to render the same effective or ineffective to secure



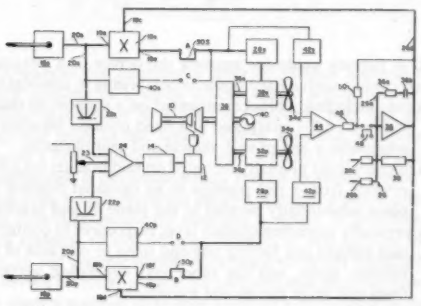
a propeller unit flange on the outside of said body opening flange.

4,036,164

TWIN CONTROLLABLE PITCH PROPELLERS OPERATED FROM SINGLE PRIME MOVER

Ronald A. Kowach, and William I. Rowen, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,839
Int. Cl.[2] B63H 3/10
U.S. Cl. 115—37 6 Claims



1. A control system for a variable pitch twin propeller propulsion system of a vessel including a port propeller and a starboard propeller, both of said propellers being driven through a transmission by a single prime mover operating at a predetermiend substantially fixed rotational speed and wherein said port and starboard propellers are to present a substantially fixed load to said prime mover in a first mode, said control system comprising:

an isochronous governor for generating a signal representative of a deviation from said predetermined system fixed rotational speed,

port manual control means for generating a signal representative of a setting of the desired pitch for said port propeller, and starboard manual control means for generating a signal representative of a setting of the desired pitch for said starboard propeller,

port servo means for setting the pitch of said port propeller,

said port servo means being responsive to a first signal for setting the pitch of said port propeller, and said starboard servo means being responsive to a second signal for setting the pitch of said starboard propeller,

a port multiplier for applying a first signal to said port servo, and a starboard multiplier for applying a second signal to said starboard servo, each said multiplier having a first input and a second input and an output,

means for connecting said signal from said isochronous governor to the first input of said port and starboard multipliers, and

means for connecting said signal from said port manual control means to the second input of said port multiplier, and means for connecting said signal from said starboard manual control means to the second input of said starboard multiplier, and

means for connecting the output of said port multiplier to the port servo means and means for connecting the output of said starboard multiplier to said starboard servo means.

4,036,165

PARKING GUIDE

Harmin V. Wood, 617 Hanford Place, Westfield, N.J. 07090

Filed May 11, 1976, Ser. No. 685,294
Int. Cl.[2] B60Q *1/06*; G09F *17/00*
U.S. Cl. 116—28 R **6 Claims**

1. A parking guide for assisting the driver of a vehicle to avoid contact with a fixed obstacle comprising in combination:

means including a bracket mounted on a support so that its forward end is interposed at a fixed position between the approaching end of said vehicle and said obstacle,

a fulcrum lever pivotally mounted on said bracket for partial rotation from a rest position to an operated position in a plane substantially parallel to the plane of said bracket,

a vertically extending contact lever responsive to contact by said vehicle and having one end fixed to one side of said fulcrum lever, and the other end depending vertically from said lever for pivotal movement,

a bell comprising a resonator and a clapper mounted on the bracket, said clapper disposed to strike said bell in response to movement of said fulcrum lever to the operated position,

a reflector plate having an extended surface rotatably mounted on said bracket adjacent the forward end thereof, said reflector plate being spring biased and retained by a first means in a retracted position substantially parallel to said bracket, and said reflector responsive to rotation of said fulcrum lever to assume a fully visible position in the line of vision of said driver, and

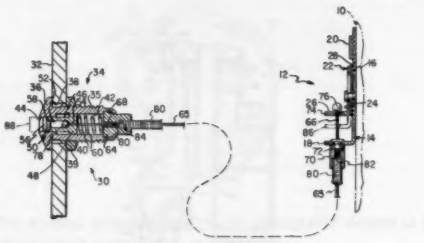
a second means connected to said fulcrum lever and responsive to deflection of said contact lever by said vehicle to move said fulcrum lever from the rest position to the operated position, initiating the striking of said resonator by said clapper, causing release of said first means and the rotation of said reflector from said retracted position to said fully visible position.

4,036,166

REMOTE HIGH TEMPERATURE INDICATING APPARATUS

William T. Fleming, Boonton, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed Mar. 10, 1976, Ser. No. 665,516
Int. Cl.[2] G01K *11/06*
U.S. Cl. 116—114.5 **8 Claims**



1. Apparatus for indicating at a visually accessible location remote from an object whether the temperature of said object has at some time reached a predetermined high temperature comprising:

a sensor assembly including,

a first bracket formed of a heat conducting material having first and second surfaces, said bracket adapted to be fixedly fastened to said object with said first surface thermally communicating with said object,

a second bracket adjacent said second surface of said first bracket and adapted for movement in a predetermined direction relative to said first bracket,

a fusible material having a fusion temperature in range including said predetermined high temperature, said fusible material joining said first and second brackets;

an elongated flexible member having a first end held in fixed relationship relative to said second bracket and terminating at a second end; and

indicating means for indicating whether said first end is restrained relative to said first bracket including

a housing having an opening,

a plunger slidably contained within said housing movable between a first exposed position and a second position at least partially within said housing,

a spring urging said plunger towards said exposed position, said spring also engaging said second end of said elongated flexible member and urging movement of said second bracket relative to said said base first bracket in said predetermined direction.

4,036,167

APPARATUS FOR MONITORING VACUUM DEPOSITION PROCESSES

Chih-shun Lu, Cupertino, Calif., assignor to Inficon Leybold-Heraeus Inc., East Syracuse, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,936
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—7 **7 Claims**

1. In a vapor deposition system having a vapor deposition chamber in which a substrate to be coated is received, and an evaporant source in the chamber providing vaporized particles for deposit on the substrate, a sensor for determining the deposition rate and composition of the vapor atmosphere in the chamber, said sensor comprising:

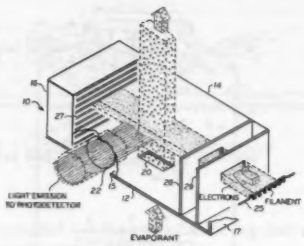
an enclosure arranged in the path of the evaporant particles to receive a sample of the vaporized particles in the deposition chamber;

an electron beam source providing relatively low energy electrons sufficient to excite the outer shell electrons of

the atoms of the sample of the vaporized particles in said enclosure;

an optical opening in said enclosure receiving the light emitted by the photons produced as the electrons of the excited atoms drop back to lower energy states, said opening receiving light in a path perpendicular to the path of the excitation electron beam; and

a photodetector optically coupled to said opening.



4,036,168

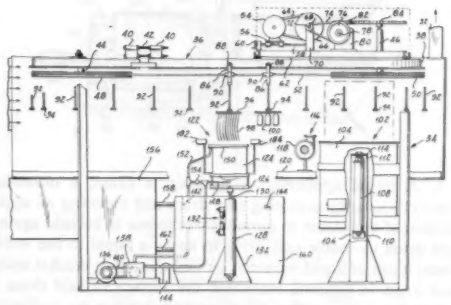
APPARATUS FOR COATING ARTICLES

Albert J. Laliberte, South Woodstock, Conn., and Armand DeAngelis, Southbridge, Mass., assignors to Omnitech Inc., Southbridge, Mass.

Division of Ser. No. 395,779, Sept. 10, 1973, Pat. No. 3,956,540. This application Nov. 17, 1975, Ser. No. 632,368

Int. Cl.[2] B05C *21/00, 3/02*

U.S. Cl. 118—8 **3 Claims**



1. Apparatus for coating an article with a curable synthetic resin including in combination, a chamber, means in said chamber at a coating station for applying a coating of synthetic resin to an article, means for heating the ambient temperature in said chamber to a temperature sufficiently above room temperature to precure a coating of said resin applied to an article, a reservoir for holding a supply of said coating resin, means for feeding resin for said supply to said applying means, and means for cooling said supply of resin in said reservoir to a temperature below room temperature, said apparatus including a precuring zone in said chamber and a conveyor for carrying articles to said coating station and from said coating station through said precuring zone, cleaning means at a cleaning station, said conveyor successively carrying said article to said cleaning station and to said coating station and from said coating station through said precuring zone, said applying means comprising a tank, means mounting said tank below said conveyor and means for moving said article at said coating station and said tank relative to each other to immerse said article in said resin and to withdraw said article from said resin, said moving means performing one of said immersing and withdrawal operations at a relatively rapid rate and the other of said immersing and withdrawal operation at a relatively slower controlled rate, said means for moving said article at said coating station and said tank relative to each other comprising means mounting said tank below said conveyor for movement from a first position remote from said conveyor to a second position adjacent to said conveyor, means for rapidly raising said tank from said first position to said second position to immerse articles supported by said conveyor at said cleaning station, and means for relatively slowly lowering said tank at a controlled rate from said second position toward said first position to withdraw said articles from said solution, said apparatus including means responsive to complete withdrawal of said articles from said tank for rapidly returning said tank to its first position.

4,036,169

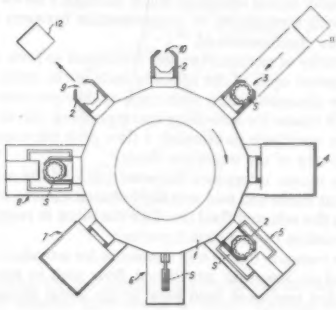
APPARATUS FOR COATING ARTICLES

Peter Harvey, London, England, assignor to MacPherson Powders Limited, England

Division of Ser. No. 463,580, April 24, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,512

Int. Cl.[2] B05C *19/00*

U.S. Cl. 118—66 **10 Claims**



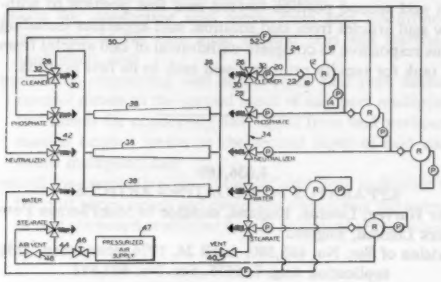
1. Apparatus for applying a layer of plastics material to selected surfaces of a metal article which article has slots extending throughout its length and opening into first and second end faces of the article, which apparatus comprises means for a first heating of the article, a plurality of operating stations located at circumferentially spaced locations around a circular path, which operating stations comprise a slot-coating station providing means for directing a stream of powdered plastics material to slot defining surfaces of said slots of the article, an end coating station including a vertically adjustable table having a carrier surface for carrying and applying powdered plastics material to at least a part of a downward facing first end face to the article, a turning station incorporating means for turning the article over so that the second end face is downward facing, a second end coating station incorporating a vertically adjustable table having a carrier surface for carrying and applying powdered plastics material to at least a part of the second end face of the article, means for a second heating of the article to coalesce the plastics material and form a coating on each selected surface of the article, means for conveying the article through the several operating stations to enable the coating of the surfaces defining the slots and both end faces of the article for delivery to the means for second heating, and article support means on said means for conveying for receiving the article from said means for first heating, onto said means for conveying, the stations being arranged around the circular path in any order, provided that the turning station is encountered between the two end coating stations on passing around the circular path.

4,036,170

MEANS FOR APPLYING ZINC STEARATE COATINGS TO THE BORE SURFACES OF FERROUS ALLOY TUBES

Harold Goodheim, Elnora, N.Y., assignor to The United States Government, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,325
Int. Cl.[2] B05C *7/04*
U.S. Cl. 118—73 3 Claims



1. In a system for successively flowing each of a plurality of individually stored treatment fluids through a series of parallel tubes, with a minimum of contamination between successive fluids, the combination of,

a plurality of multiport valves connected to form a manifold adjacent each of the opposite ends of the tubes in respective communication with each of the treatment fluids,

switch means for activating corresponding valves in each of said manifolds to establish a flow path between the tubes and one of the treatment fluids,

pump means interposed between each of the stored treatment fluids and said manifold nearest thereto for circulating the selected fluid through the tubes in response to the actuation of said switch means,

valve means in one of said manifolds for introducing pressurized air into said established flow path to force said selected treatment fluid back to the initial storage position thereof, and

vent means in the other of said manifolds for exhausting said pressurized air from said flow path to thereby purge any residue of said selected treatment fluid therein prior to the circulation of the next selected treatment fluid through the tubes.

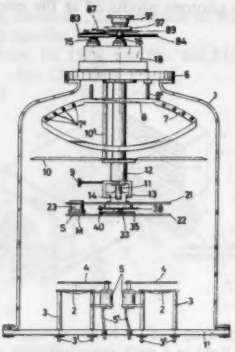
4,036,171

VACUUM DEPOSITION THROUGH PLURAL MASKS ON PLURAL SUBSTRATES

Gilbert Ramet, Chesceaux-Noreaz, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Mar. 3, 1975, Ser. No. 554,458
Claims priority, application Switzerland, Mar. 4, 1974, 3000/74
Int. Cl.[2] C23C *13/12*
U.S. Cl. 118—49.1 6 Claims

1. Apparatus for depositing under vacuum successive plural layers on a plurality of substrates with the use of masks, comprising a vacuum chamber, and in said chamber at least one support carrying substrates, at least one support carrying masks, and means for the vacuum deposition of at least two layers of material contained in evaporative cups on the said substrates through the said masks, said substrate support comprising a horizontal rotating plate, said mask support comprising a rotating plate parallel to the first-mentioned plate, and the means for depositing layers comprising at least one cup containing materials to be disposed on the substrates, a mechanism for changing masks which permits moving the rotatable plates toward and away from each other and advancing one of them with respect to the other, an alignment system for masks relative to the substrates, and drive mechanism for uniformly rotating the assembly of masks and substrates, characterized in that a rotative drive axle of the substrate support and an axle of



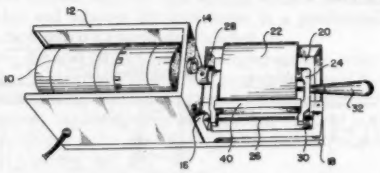
the mask support are coaxial and in that the mask and substrate supports are secured in the vacuum chamber to the ends of these axles.

4,036,172

LIQUID APPLICATOR

Carlo Re, 2947 N. Bristol St., Santa Ana, Calif. 92607

Filed May 20, 1976, Ser. No. 688,144
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—262 3 Claims



1. A liquid applicator comprising: a drum; a mounting bracket rotatably mounting said drum and exposing an upper portion of said drum to permit a workpiece to be held against said drum to enable said drum to apply a liquid to the workpiece; a pan of liquid mounted on said mounting bracket under said drum in position such that the surface of said drum is below the surface of the liquid in said pan when the applicator is operational for applying a liquid coating to the surface of said drum; and a rod supported on the surface of said drum and extending parallel to the axis of rotation of the drum for controlling the thickness of the liquid coating applied to the surface of the drum, said rod having shoulders at each end thereof and an uninterrupted surface between shoulders, said shoulders determining the space between the uninterrupted surface of the rod and the surface of the drum, and said space determining the thickness of the liquid coating on the surface of the drum.

4,036,173

INTERNAL COATING AND SANDBLASTING BUG FOR PIPE

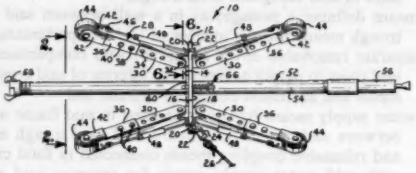
Manfred E. Nicklas, 1627 Redwood Drive, Harvey, La. 70058

Filed July 21, 1975, Ser. No. 597,515
Int. Cl.[2] B05C *7/02*
U.S. Cl. 118—306 5 Claims

1. Apparatus adapted to travel through a hollow, open-ended object to allow work to be performed on the internal surface of the object through utilization of a tool having a flange plate rigid therewith, said apparatus comprising:

a central mounting plate adapted to receive said flange plate in abutting relationship;

a plurality of legs extending outwardly from said mounting plate in the direction of said internal surface;



a wheel mounted on the end of each leg and adapted to engage said internal surface; and

releasable locking means for releasably securing said flange plate to said mounting plate.

4,036,174

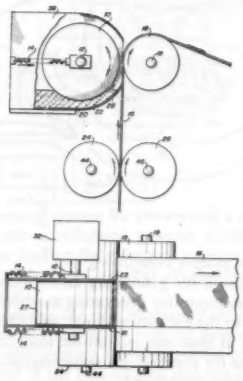
APPARATUS FOR THE APPLICATION OF COLORANT TO POLYMERIC SURFACE

Arvind R. Saklikar, Park Forest, and Jack M. Van Eck, South Holland, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 546,582, Feb. 3, 1975. This application Mar. 29, 1976, Ser. No. 671,200

Int. Cl.[2] B05C *5/02*

U.S. Cl. 118—623 **7 Claims**



1. Apparatus for applying a design of polymeric colorant to a polymeric surface, said apparatus comprising:

a cylindrical roller magnet mounted for rotation about its longitudinal axis including a cylindrical outer surface and means for continuously rotating said roller magnet between a colorant reservior and a colorant application zone disposed in operative communication with a work path;

non-magnetic side walls extending radially outward at least from said roller magnet outer surface to said application zone for controlling the width of colorant applied to said surface along said work path;

means for positioning said polymeric surface along said work path in operative communications with said application zone;

means for continuously urging said roller magnet toward said work path into positive contact with said polymeric surface;

a reservoir for holding a supply of a magnetic powder and polymeric colorant mixture in close proximity to at least the magnet outer surface in a manner such that at least said outer surface will attract the mixture during rotation of said roller magnet and carry said mixture toward said application zone; and,

means for moving said roller magnet and polymeric surface relative to each other along said work path whereby said magnet will continuously attract said mixture thereto during rotation thereof and will continuously carry said mixture to said application zone where at least said colorant will be applied to said polymeric surface and at least temporarily retained thereon by a triboelectric effect caused by said roller magnet being urged into contact with said polymeric surface along said work path.

4,036,175

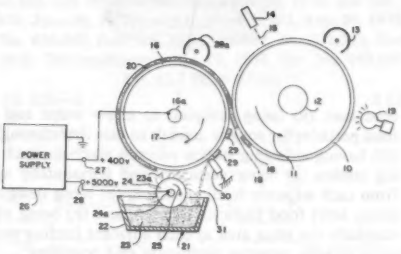
HIGH SPEED DEVELOPMENT TECHNIQUE

Edwin R. Phillips, Rosemont, and Raymond J. Stankiewicz, Philadelphia, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,794

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—651 **23 Claims**



1. In a system for developing images utilizing the deposition of toner on selected portions of an image forming substrate which are caused to assume values of electric potential distinctively different from those of other portions of the image forming substrate, said system including an auxiliary substrate, means for applying to the auxiliary substrate a coating of the toner having an electric charge of a predetermined polarity, and means for bringing the coated auxiliary substrate into close proximity to the image forming substrate for transfer of toner to the selected portions of the image forming substrate,

the improvement which comprises:

means for establishing, between the auxiliary substrate and the coating applying means, a potential difference of such polarity as to propel the charged toner away from the applying means and toward the auxiliary substrate, and

at least the surface of the auxiliary substrate which is coated with the toner being made of a metal conductor.

4,036,176

SYSTEM FOR CULTURING AQUATIC ANIMALS

James C. McCarty, San Carlos, and Dominick Mendola, Sausalito, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 546,381, Feb. 3, 1975, abandoned. This application Nov. 20, 1975, Ser. No. 633,900

Int. Cl.[2] A01K *61/02*

U.S. Cl. 119—3 **13 Claims**

1. An apparatus for culturing aquatic animals which comprises

a. a container suitable for retaining water;

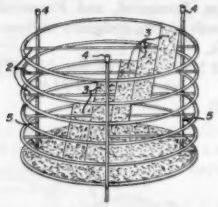
b. a plurality of horizontally oriented platforms vertically spaced from each other in said container, said platforms (i) having an area which is slightly less than the inside cross-sectional area of said container, (ii) being substantially

parallel to each other, and (iii) being designed to allow water and solid aquatic animal food particles to pass therethrough, and

c. a feeding station having an area smaller than the platform on which it is placed and being placed on each of said platforms in a manner so that each feeding station (i) is vertically and horizontally spaced from each adjacent station, (ii) has a structure such that said solid food particles are retained thereon when dropped onto said feeding station, and (iii) is of substantially the same area as the adjacent feeding station.

11. A process for raising aquatic animals in a closed-loop aquaculture system which comprises

placing in a container a plurality of horizontally oriented platforms substantially parallel to and vertically spaced from each other, said platform (i) having an area which is slightly less than the inside cross-sectional area of said



container, (ii) being designed to allow water and solid food particles for aquatic animals to pass therethrough and (iii) having a feeding station on each platform, each feeding station (a) being vertically and horizontally spaced from each adjacent feeding station, (b) being designed to retain solid food particles thereon, and (c) being of substantially the same area as each adjacent feeding station;

placing suitable aqueous medium in said container;

placing aquatic animals in said medium;

dropping suitable food particles onto the surface of said aqueous medium so that approximately equal amounts of such food particles fall on each of said feeding stations at suitable intervals;

passing said aqueous medium from said container through a biological filter to convert ammonia and nitrites in said aqueous medium to non-harmful amounts of nitrates; and

passing said aqueous medium exiting from biological filter back to said container.

4,036,177

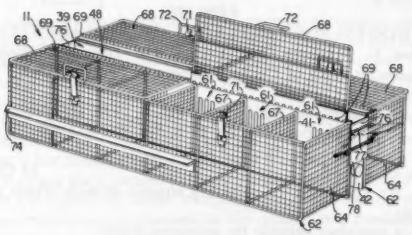
BIO-TEST CAGE AND SUPPORT THEREFOR

Phillip A. DeSmit, Portage, Mich., assignor to Unifab Corporation, Kalamazoo, Mich.

Filed Feb. 13, 1976, Ser. No. 657,969

Int. Cl.[2] A01K *1/02*

U.S. Cl. 119—18 **8 Claims**



5. An animal confining and housing device, comprising:

elongated frame means, said elongated frame means including at least one elongated food trough means fixedly secured to said frame means for holding a supply of food therein;

at least a pair of rows of separate compartments fixedly secured to said frame means and extending coextensively with said elongated food trough means and on opposite sides of said elongated food trough;

means defining a passageway in a wall between said food trough means and the interior of said compartments;

separate removable cover means for said compartmens in said rows to permit access to the interior of said compartments and an animal contained therein; and

water supply means fixedly connected to said frame means between said pair of rows below said food trough means and releasable coupling means connected in fluid circuit with said water supply means for securing said water supply means to a source of water, said water supply means including valve means in a plurality of said compartments positioned on said wall adjacent said passageway means and being operable by an animal present in said plurality of compartments to release water for consumption by the animal.

4,036,178

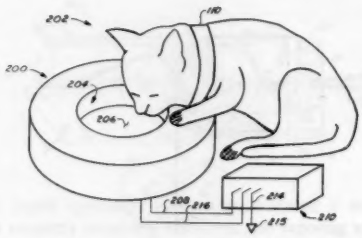
ELECTRONIC LOCK AND KEY SYSTEM

Barry Thomas Lee, 22715 Clarendon St., Canoga Park, Calif. 91364, and Gilbert Peter Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 438,328, Jan. 31, 1974, Pat. No. 3,897,753. This application June 2, 1975, Ser. No. 583,136

Int. Cl.[2] A01K *5/02*

U.S. Cl. 119—51 R **33 Claims**



1. A control system comprising:

excitation means for generating an excitation signal;

identification means for generating an identification signal in response to the excitation signal, said identification means including at least one monolithic integrated circuit;

sensor means for generating a sensor signal in response to the identification signal; and

control means for providing control in response to the sensor signal.

4,036,179

ANIMAL PROTECTOR

James E. Turner, and Louise L. Turner, both of 15346 25th NE., Seattle, Wash. 98155

Filed Apr. 7, 1976, Ser. No. 674,405

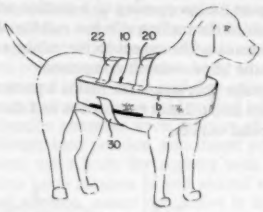
Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—96 **4 Claims**

3. An animlal protector, comprising:

an elongated, resilient pad having a horizontal upper wall, a horizontal lower wall, vertical end walls, a bent central portion connected to parallel spaced end portions terminating at said end walls and defining a cavity therebetween, upper strap means connected between the parallel spaced end portions and spanning over said cavity, and lower strap means connected between the parallel spaced end portions and spanning below said cavity whereby the

pad is adapted to be suspended around an animal's neck with the upper strap means riding on the animal's back and the lower strap means riding on the animal's belly,



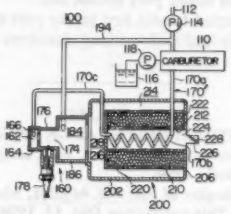
said pad having a thickness sufficient to prevent the animal's mouth from reaching the belly, back and rear extremities of the animal.

4,036,180

FUEL REFORMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 3, 1976, Ser. No. 663,470
Claims priority, application Japan, Mar. 5, 1975, 50-27490
Int. Cl.[2] F02B *43/08*; F02M *31/00*
U.S. Cl. 123—3 **11 Claims**



1. A fuel reforming system for converting a rich mixture of air and a fuel into a reformed gaseous mixture containing hydrogen and for feeding the reformed gaseous mixture into a combustion chamber of an internal combustion engine, said system comprising:

means for producing the rich mixture of air and the fuel;

a burner of vortex combustion type for imperfectly burning the rich air-fuel mixture to cause partial oxidation of the fuel contained in the rich air-fuel mixture thereby to produce a partially oxidized gaseous mixture;

said burner including an ignition chamber disposed downstream of said rich mixture producing means so that the rich air-fuel mixture is introduced into said ignition chamber to form a vortex of the rich air-fuel mixture therein, said ignition chamber being provided with an igniting means for igniting the rich air-fuel mixture received from said rich mixture producing means, said burner further including an imperfect combustion chamber disposed in communication with said ignition chamber for receiving the thus ignited rich air-fuel mixture from said ignition chamber to cause the partial oxidization of the fuel and thus produce the partially oxidized gaseous mixture;

a reactor vessel provided with an inlet through which the interior of said vessel is communicated with said imperfect combustion chamber of said burner, said reactor vessel being also provided with an outlet leading to said combustion chamber of said engine;

generally tubular means defining therein a central passage and a generally tubular chamber surrounding said central passage and being in fluid flow communication therewith, said tubular means being disposed in said reactor vessel so that said tubular means and said reactor vessel cooperate to define therebetween a second passage surrounding said tubular chamber and being in fluid flow communication with said imperfect combustion chamber and with said tubular chamber and so that said central passage is connected to said reactor vessel, whereby said partially oxidized gaseous mixture can flow through said second passage into said tubular chamber; and

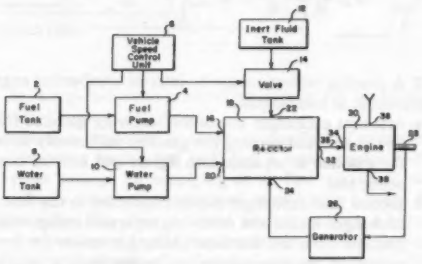
catalyst means disposed in said tubular chamber for facilitating catalytic conversion of said partially oxidized gaseous mixture to the reformed gaseous mixture, the reformed gaseous mixture thus produced flowing out of said tubular chamber into said central passage and then through said outlet of said reactor vessel toward said combustion chamber of said engine.

4,036,181

HIGH TEMPERATURE FLUID-WALL REACTORS FOR TRANSPORTATION EQUIPMENT

Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Continuation-in-part of Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434, and Ser. No. 591,949, June 30, 1975, and Ser. No. 591,950, June 30, 1975, and Ser. No. 606,222, Aug. 20, 1975, and Ser. No. 616,393, Sept. 24, 1975, and Ser. No. 631,912, Nov. 14, 1975. This application Jan. 19, 1976, Ser. No. 649,964
Int. Cl.[2] F02B *43/00*
U.S. Cl. 123—3 **8 Claims**



1. A fuel converter for a transportation vehicle powered by an internal combustion engine comprising:

a. a container for a hydrocarbon fuel;

b. a tank for water;

c. an electrical power source;

d. a high temperature fluid-wall reactor for converting the hydrocarbon fuel and water into a synthesis gas mixture containing carbon monoxide and hydrogen, the reactor having (d.1) a hydrocarbon fuel input, (d.2) a water input, (d.3) an electrical power input, (d.4) a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, (d.5) means for generating an annular envelope of an inert fluid which is substantially transparent to radiation radially inwardly of the inner surface of the reactor tube to constitute a protective blanket for the inner surface, (d.6) means connected to the hydrocarbon fuel input for introducing the hydrocarbon fuel into the reactor chamber through the inlet end of the reactor tube in a predetermined path axially of the reactor tube, the hydrocarbon fuel being confined by the protective blanket substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube, (d.7) means connected to the water input for introducing water into the reactor chamber along at least a portion of the predetermined path of the hydrocarbon fuel, (d.8) electrical means connected to the electrical power input for directing high intensity radiant energy into the reactor chamber to coincide with at least a por-

tion of the predetermined path of the hydrocarbon fuel, and (d.9) a gas mixture output connected to the outlet end of the reactor tube;

e. means for metering fuel from the container into the hydrocarbon fuel input of the reactor;

f. means for metering water from the water tank into the water input of the reactor;

g. means for metering electrical power from the power source into the power input of the reactor, and

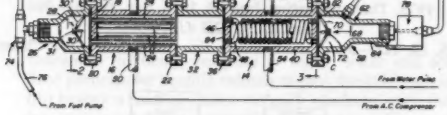
h. a manifold connecting the gas mixture output of the reactor to a combustion fuel input of the internal combustion engine for directing the synthesis gas mixture from the reactor to the engine.

4,036,182

GASOLINE REFRACTIONATOR FOR INTERNAL COMBUSTION ENGINES

Mack C. Gandy, Tatum, N. Mex., assignor to Dale Gandy, Lovington, N. Mex., a part interest

Filed May 13, 1976, Ser. No. 686,669
Int. Cl.[2] F02B *43/08;* F01P *1/06*
U.S. Cl. 123—3 **15 Claims**



7. A gasoline refractionator for internal combustion engines, comprising, in combination:

a. first heat exchanger means for receiving gasoline from a fuel source and cooling the gasoline sufficiently to cause the gasoline to separate into lighter and heavier components; and

b. second heat exchanger means connected to the first heat exchanger means and receiving separated components of gasoline from the first heat exchanger means for heating separately the components to a temperature at which the components will tend to remain separated even when in physical contact with one another.

4,036,183

ROTARY PISTON ENGINE

Toshihiko Igashira, Toyokawa; Shunzo Yamaguchi, Mishio, and Masami Hujita, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation-in-part of Ser. No. 470,294, May 15, 1974, Pat. No. 3,977,368. This application Apr. 25, 1975, Ser. No. 571,743
Claims priority, application Japan, Apr. 29, 1974, 49-48417; May 7, 1974, 49-50455; June 14, 1974, 49-68576
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.[2] F02B *53/10*
U.S. Cl. 123—8.13 **7 Claims**

1. A rotary piston engine comprising:

housing means having a trochoidal peripheral wall and side walls,

rotor means disposed within said housing and having sides cooperating with the peripheral and side walls of said housing to define a plurality of working chambers respectively,

said rotor means being operable to perform a planetary rotary movement causing the engine to perform intake, compression, combustion and exhaust strokes,

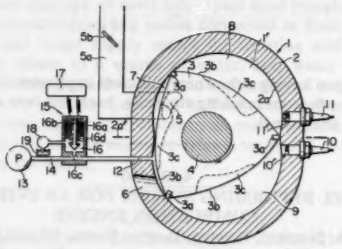
first intake port means formed in a portion of said housing which is on the leading side in a rotational direction of said rotor means with respect to the minor axis of trochoidal curves of said peripheral wall,

said first intake port being adapted to open into one of said working chambers which is in the intake stroke, and

exhaust port means opening to a portion within the housing which is on the trailing side in a rotational direction of said rotor means with respect to the minor axis,

wherein the improvement comprises:

second intake port means formed in a portion of said housing between said exhaust port means and the minor axis of the trochoidal curves,



said second intake port means being adapted to directly open into one of said working chambers which is at the initial stage of the intake stroke,

means connected to said second intake port means for supplying rich mixture into said working chambers through said second intake port means, and

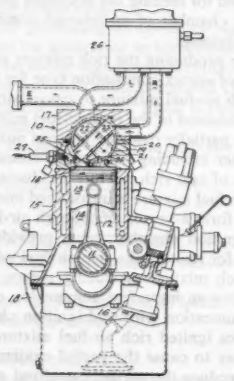
means connected to said first intake port means for supplying air only into said working chambers through said first intake port means.

4,036,184

STRATIFIED CHARGE ENGINE

William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 449,241, March 8, 1974, Pat. No. 3,948,227. This application Dec. 13, 1974, Ser. No. 532,391
Int. Cl.[2] F02M *13/06;* F02B *19/10;* F01L *7/00*
U.S. Cl. 123—75 B **2 Claims**



1. A stratified charge engine comprising an engine block, a cylinder within said block, a piston mounted for reciprocation within said cylinder and defining therewith a main combustion chamber, a pre-combustion chamber in open communication

with said main combustion chamber, first and second valve bodies adjacent said cylinder, a first inlet passage for transmitting a lean fuel/air charge from a metering device to said first valve body, a second inlet passage for transmitting a rich fuel/air charge from a metering device to said first valve body, a first inlet port in said first valve body for establishing communication between said first inlet passage and said main combustion chamber upon rotation of said valve body to a predetermined position, a second inlet port in said first valve body for establishing communication between said second inlet passage and said pre-combustion chamber upon rotation of said valve body to such predetermined position, an exhaust port defined through said second valve body for registry with said main combustion chamber upon rotation of said second valve body to a predetermined position, means responsive to engine load for adjusting timing of the establishment of sequential communication of said first inlet port and said exhaust port with said first inlet passage and said exhaust manifold respectively wherein the time of communication is controlled in response to engine load when the piston is adjacent top dead center and also when the piston is adjacent bottom dead center during normal intake and exhaust cycles of the engine.

4,036,185

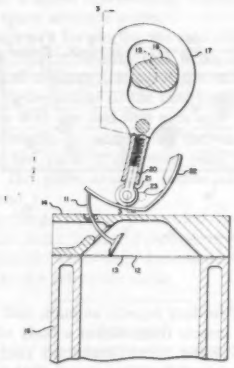
ENERGY-EFFICIENT VALVE GEAR

Edward H. Key, 910 E. Illinois St., Wheaton, Ill. 60187

Filed Apr. 9, 1976, Ser. No. 675,613

Int. Cl.² F01L *1/30*

U.S. Cl. 123—90.25 **2 Claims**



1. An improvement to a valve train comprising a cylinder head and poppet valve thereon, a valve-actuating rocker platen pivotally mounted on said cylinder head by means of a pivot member so that said platen may pivot between positions on either side of said member, a valve connected to one end of said rocker platen for movement of said valve simultaneously with movement of said rocker platen between said rocker platen positions, and actuator means for moving said rocker platen between said positions thereby positively moving said valve between its open position and its closed position, said actuator means comprising a rotary cam means and cooperating follower pivotally mounted and spring-biased into engagement with said rocker platen and engaged with said cam means for pivoting said rocker arm upon rotation of said cam means, said follower comprising a pivotally mounted casing, spring-biased plunger means on said casing and biased to a roller bearing on and adapted to ride over said rocker platen thereby to move said platen between said positions, the roller rotatably attached to the pivoted plunger means at the roller center of rotation; the improvement wherein the platen is pivotally mounted at a point above the surface on which the roller rides and further, the radius of the roller equals the vertical distance from the platen to the point of pivotal mounting so that the center of rotation of the roller passes through the axis of the pivot point of said platen.

4,036,186

AIR-FUEL MIXTURE RATIO CORRECTING SYSTEM FOR CARBURETOR

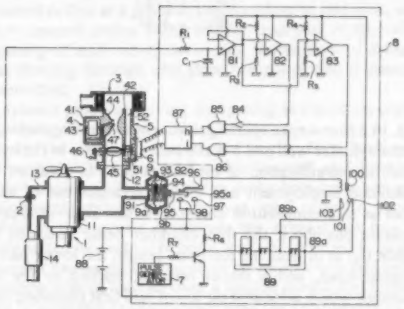
Tadashi Hattori, Nishio; Shigetaka Takada, Oobu; Kenji Hayashi, Aichi, and Toshiharu Iwata, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed June 3, 1974, Ser. No. 475,917

Claims priority, application Japan, June 4, 1973, 48-63243; June 4, 1973, 48-63244; June 4, 1973, 48-63245; July 26, 1973, 48-84346; Sept. 27, 1973, 48-109060

Int. Cl.² F02M *7/00, 13/04;* **G01N** *3/00, 27/42*

U.S. Cl. 123—32 EA **14 Claims**



1. An air-to-fuel ratio controlling system for an internal combustion engine comprising:

a carburetor connected to an intake manifold of an internal combustion engine and including a main passage and a bypass passage for supplying an air-fuel mixture to said engine; a main valve positioned in said main passage for controlling the amount of the air-fuel mixture, a bypass valve positioned in said bypass passage for compensating the air-to-fuel ratio of said air-fuel mixture by controlling the amount of air flow therethrough;

a pulse motor coupled to said bypass valve for driving said valve in order to control the degree of opening of said bypass valve;

a pulse generator for generating a train of pulses having a frequency which varies in proportion to the rotational speed of said engine;

a frequency divider connected to said pulse generator for converting the train of pulses from said pulse generator into plural trains of pulses having different and lower frequencies;

detecting means coupled to an intake manifold of said internal combustion engine for detecting a rapid change of the operational speed of said internal combustion engine;

selecting means connected to said detecting means for selecting one of said plural trains of pulses from said frequency divider in accordance with the detected operational speed of said engine;

air-to-fuel ratio sensing means disposed in an exhaust manifold of said internal combustion engine for detecting the air-to-fuel ratio of the air-fuel mixture supplied to said engine; and

a control circuit connected to said selecting means, said air-to-fuel ratio sensing means and said pulse motor for driving said pulse motor at a speed determined by the selected train of pulses from said selecting means, the rotational direction of said pulse motor depending on the output from said air-to-fuel ratio sensing means.

4,036,187

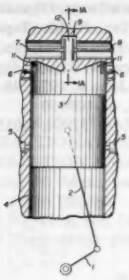
CLEAN SPARK IGNITION INTERNAL COMBUSTION ENGINE

Hui-tzeng Ting, P.O. Box 18, Crum Lynne, Pa. 19022

Continuation-in-part of Ser. No. 376,304, July 5, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,409

Int. Cl.[2] F02B *19/10, 19/16*

U.S. Cl. 123—32 SP **4 Claims**



1. In a four-stroke spark ignition engine having fuel injectors in the cylinder wall and a combustion chamber in the cylinder-head, the stratification of air-fuel mixture is obtained by the combined employment and unique arrangement of such devices as said combustion chamber which is divided into two separate chambers, the first chamber being bounded by the piston top at or near the top dead center, the lower part of the cylinder-head, and a throat opening leading to the second chamber which is located on top of said first chamber; the inlet and exhaust valves which are located in said second chamber; the fuel injector or injectors which are located at or near the bottom dead center, and create atomized fuel droplets covering the vicinity of the piston top when injection takes place at the bottom dead center; and the spark plug or plugs which are located at or near the bottom of said first chamber, such that said stratification of air-fuel mixture is obtained with the rich mixture at or near the piston top during the end of intake stroke, and said stratification is maintained throughout the ensuing compression stroke due to the fact that the time interval of said compression stroke is extremely short as compared with the time required by natural diffusion or turbulence to undo said stratification such that at the instant of ignition a lean mixture is trapped in said second chamber, and a rich mixture is trapped in said first chamber where said spark plug or plugs give ignition to said rich mixture first, and the ignited mixture will reach more complete combustion later during the expansion stroke by mixing with the lean mixture released from said second chamber.

4,036,188

CARBURETOR EQUIPPED WITH A COOLING SYSTEM

Hiroshi Sami; Kaoru Taira, and Teruo Kumai, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

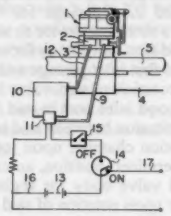
Filed Nov. 8, 1974, Ser. No. 522,131

Claims priority, application Japan, July 18, 1974, 49-82482

Int. Cl.[2] F01P *1/06*

U.S. Cl. 123—41.31 **4 Claims**

1. A carburetor in an internal combustion engine which incorporates intake manifold heating by exhaust gases to improve startability and warming-up performance of the engine, comprising a fluid cooling system means for a carburetor casing, said cooling system means including a pumping means for a cooling fluid and a power circuit means for said pumping means, said power circuit means incorporating an engine ignition switch and a timer and adapted to drive said pumping



means for only a predetermined duration from the instant when said ignition switch is opened.

4,036,189

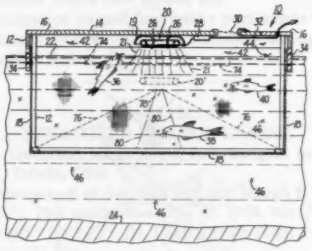
COLLECTION AND FEEDING OF INSECTS TO ANIMALS

Gregor N. Neff, 85 Myrtle Ave., Dobbs Ferry, N.Y. 10522

Division of Ser. No. 497,540, Aug. 14, 1974, Pat. No. 3,951,104, which is a continuation-in-part of Ser. No. 477,839, June 10, 1974, abandoned, and Ser. No. 460,619, April 12, 1974, Pat. No. 3,939,802, which is a continuation-in-part of Ser. No. 213,966, Dec. 30, 1971, abandoned. This application Feb. 10, 1976, Ser. No. 656,890

Int. Cl.[2] A01K *61/02*

U.S. Cl. 119—51 R **23 Claims**



1. A method of feeding aquatic animals, said method comprising attracting insects from within a body of water by directing into said water electromagnetic energy consisting predominantly of energy having a wavelength in the range of 3,000 Angstroms to 4,000 Angstroms, and feeding said insects to said animals.

4,036,190

DEVICE FOR AUTOMATIC CONTROL OF ELECTRONIC SPARK IGNITION ADVANCE FOR INTERNAL COMBUSTION ENGINES

Umberto Bigliani, Leumann-Collegno (Turin), and Rafael Jacoel, Milan, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed May 10, 1976, Ser. No. 684,824

Claims priority, application Italy, June 10, 1975, 68488/75

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 D **6 Claims**

1. Device for the automatic control of spark advance in an electronic ignition system for an internal combustion engine, of the type comprising an ignition spark discharge control circuit which controls the discharge, reference means located on a rotary part of the engine and comprising a protuberance phase-displaced in advance, with respect to a top dead centre reference on the rotary part, by an angle equal to the maximum spark advance angle required, at least one series of teeth located on the said rotary part, first and second electromagnetic

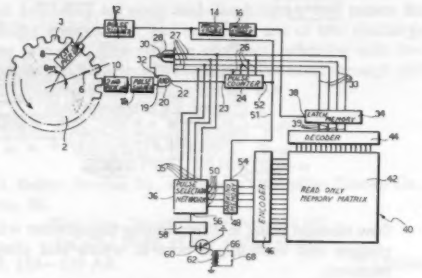
pick-ups which cooperate with said protuberance and with said teeth to provide respective electrical output pulses, and a circuit connected to said pick-ups for variation of the instant of discharge,

wherein the improvements consists in that the circuit for the variation of the instant of discharge comprises:

pulse counter means for counting the pulses emitted by the second pick-up as said teeth pass the said pick-up, in each ignition cycle,

means for enabling said counter for a predetermined period of time (T) commencing with the passage of the said protuberance past the first pick-up,

memory means for storing the count of said counter means after this predetermined time (T) and for transforming the



count into a signal representing a reference value of the required spark advance angle,

a parking memory for storing the said reference value,

reset means for resetting the said pulse counter means and clearing the memory means of the said reference value upon the next passage of the said protuberance in correspondence with the said first pick-up,

comparator means for comparing the said reference value stored in the parking memory with the instantaneous count in the pulse counter means after said resetting thereof, and

a spark discharge circuit connected to said comparator means, the latter initiating operation of said spark discharge circuit when said instantaneous count reaches parity with the reference value.

4,036,191

EXHAUST GAS RECIRCULATION SYSTEM

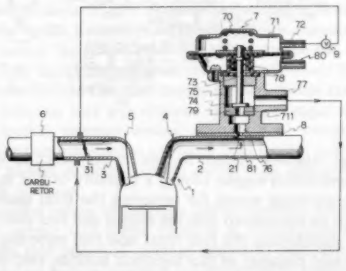
Kenichi Numata, Kariya, and Yukihiko Muramatu, Hekinan, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 8, 1975, Ser. No. 620,914

Claims priority, application Japan, Nov. 5, 1974, 49-134281[U]

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **1 Claim**



1. An exhaust gas recirculation system for internal combustion engines having an exhaust pipe and an intake pipe comprising:

a pressure control chamber with a diaphragm arrangement for receiving a pressure signal,

a shaft fixed to said diaphragm arrangement for reciprocally moving in accordance with said pressure signal,

a valve body housing an inlet and outlet,

a valve seat disposed in valve body housing between said inlet and outlet, said valve seat having a valve opening,

a valve body fixed to said shaft and disposed in said valve housing, said valve body seating on said valve seat for opening and closing said valve opening in accordance with the reciprocal movement of said shaft so that said outlet is connected with said inlet when valve opening is opened,

a bellows member fixed between said diaphragm arrangement and said valve body housing, and

a detachable gasket member disposed between said valve body housing and said exhaust pipe, and having a flow control orifice at a position corresonding to said inlet, said flow control orifice being smaller than that of the valve opening of said valve seat so that the amount of exhaust gas flowing through said flow control orifice is thereby controlled,

said exhaust pipe also having an opening at a position corresponding to said flow control orifice,

whereby the exhaust gases of said engine flow from said exhaust pipe into said intake pipe through said opening, flow control orifice, and valve body housing when said diaphragm arrangement receives said pressure signal, while in the reverse condition, the exhaust gas flow is interrupted by said valve body, and said detachable gasket member can be easily cleared or renewed when said recirculation system has run over a limited period and further can be changed in compliance with the type of engine to match the dimension of said flow control orifice to the required exhaust gas flow rate specific to said type of engine.

4,036,192

ENGINE FUEL INJECTION SYSTEM

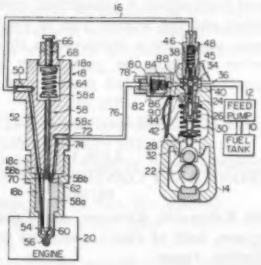
Kenji Nakayama, Higashi Matsuyama, Japan, assignor to Diesel Kiki Co., Tokyo, Japan

Filed Feb. 7, 1975, Ser. No. 548,101

Claims priority, application Japan, Feb. 8, 1974, 49-15408; Aug. 20, 1974, 49-94644

Int. Cl.[2] F02M *47/02*

U.S. Cl. 123—139 AT **13 Claims**



1. A fuel injection system for an engine comprising, in combination:

a fuel source;

a plunger pump adapted to be driven by the engine and having a barrel in which a plunger is sealingly slidable, the barrel and plunger defining a pressure chamber, the barrel being formed with a first and a second hole through the circumference thereof, the plunger being formed with a longitudinal passageway opening at one end into the pres-

sure chamber and a circumferential groove connected to the other end of the longitudinal passageway, the first hole being connected to the fuel source;

a fuel injection nozzle adapted to be operatively connected to the engine and connected to the pressure chamber, the plunger pump being connected to supply fuel from the fuel source to the nozzle at high pressure, the nozzle having a valve element biased to block fuel flow through the nozzle, the valve element having a first surface exposed to pressurized fuel from the pump so that the valve element is urged by the pressurized fuel applied to the first surface in a direction opposite to the biasing force so that the force of the pressurized fuel on the first surface overcomes the biasing force during the injection stroke of the pump plunger to move the valve element to allow fuel flow through the nozzle and thereby fuel injection into the engine, the valve element having a second surface connected to the second hole and arranged so that the pressurized fuel from the pump applied to the second surface urges the valve element in the same direction as the biasing force; and,

a valve connected to feed pressurized fuel from the pump to the second surface of the valve element near the end of the injection stroke of the plunger whereby the biasing force and the force of the pressurized fuel applied to the second surface of the valve element in combination move the valve element against the force of the pressurized fuel applied to the first surface of the valve element to move the valve element to block fuel flow through the nozzle and terminate the fuel injection, said valve including the plunger and the barrel formed with the second hole, the first and second holes being arranged so that in sequence during the injection stroke of the plunger, the second hole is covered by the end of the plunger defining the pressure chamber thereby blocking communication between the pressure chamber and the second surface of the valve element, the first hole is covered by the end of the plunger defining the pressure chamber thereby blocking communication between the pressure chamber and the fuel source, the second hole is uncovered by the circumferential groove of the plunger thereby allowing communication between the pressure chamber and the second surface for the valve element and the first hole is uncovered by the circumferential groove of the plunger thereby allowing communication between the pressure chamber and the fuel source, said valve further including a check valve unit connected between the second hole of the barrel and the second surface of the valve element of the nozzle to permit fuel flow only from the second hole to the second surface, said check valve unit comprising a chamber formed therewithin, a passageway connected between the chamber and the second hole of the barrel, and a valve element urged by a compression spring disposed in the chamber to block the passageway and formed with a longitudinal constricted passageway to bypass the passageway.

4,036,193

ELECTRONICALLY CONTROLLED FUEL INJECTION PUMP

Masayoshi Kobayashi, Kawagoe, and Takeo Kimura, Higashi-Matsuyama, both of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 274,655, July 24, 1972, abandoned. This application May 6, 1975, Ser. No. 575,077

Claims priority, application Japan, July 30, 1971, 46-67266[U]

Int. Cl.[2] F02M *39/00*

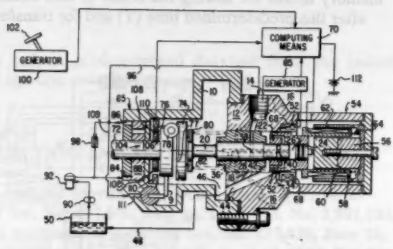
U.S. Cl. 123—139 AB **9 Claims**

1. A fuel injection pump comprising:

an enclosure;

a pump element comprising a plunger rotatingly and reciprocally movable in the enclosure to define a compression chamber of variable volume, the pump element connecting the compression chamber to a fuel inlet during an intake stroke of the pump element and connecting the compression chamber to a fuel outlet during a compression stroke of the pump element;

a movable overflow member for connecting the compression chamber to a fuel reservoir during the compression stroke of the pump element, the position of the pump element at which the overflow member connects the compression chamber to the fuel reservoir being variable in dependence on the position of the overflow member to determine the fuel injection volume, said movable over-



flow element being in direct sliding engagement with said plunger and including a bore in which said plunger is received;

an electrical actuator having a linearly movable actuator element connected to move the overflow member, said electrical actuator member comprising a solenoid and said linearly movable actuator member comprising a coil of said solenoid; and

a closed loop electrical servo control means for electrically controlling the electrical actuator to linearly move the actuator element to move the overflow member to a position corresponding to the required fuel injection volume.

4,036,194

FUEL INJECTION SYSTEM

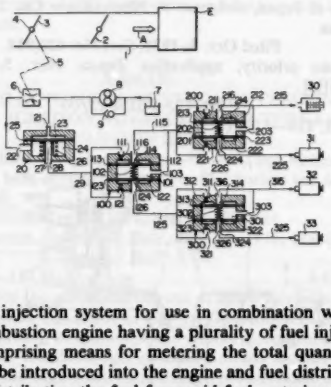
Hisanori Kobayashi, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed July 8, 1975, Ser. No. 594,089

Claims priority, application Japan, July 14, 1974, 49-80571; Oct. 3, 1974, 49-114186; Oct. 23, 1974, 49-122162

Int. Cl.[2] F02M *69/00*

U.S. Cl. 123—139 AW **9 Claims**



1. A fuel injection system for use in combination with an internal combustion engine having a plurality of fuel injection nozzles, comprising means for metering the total quantity of fuel flow to be introduced into the engine and fuel distribution means for distributing the fuel from said fuel metering means equally to said plurality of fuel injection nozzles, said distribution means including at least one fuel dividing means for dividing one fuel flow into two fuel flows in a predetermined ratio,

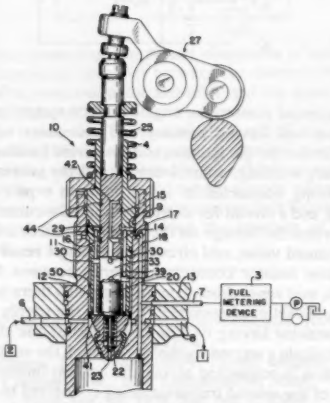
said fuel dividing means comprising a housing defining therein with at least one enclosed space, first and second diaphragms arranged to divide each said space into two outer chambers and an intermediate chamber between said outer chambers, a first inlet means into one of said outer chambers for receiving said one fuel flow, a second inlet means into the other of said outer chambers for receiving said one fuel flow, restrictor means communicated with each of said first and second inlet means for restricting fuel flow into each of said outer chambers, the opening areas of said respective restrictor means being in said predetermined ratio, discharge means having a valve port located in opposed relation with said diaphragm and a discharge passage for discharging fuel from each of said outer chambers through said valve port to said discharge passage, spring means disposed within said intermediate chamber and extending between said diaphragms, and means for introducing a part of the fuel in at least one of said discharge passages into said intermediate chamber, whereby said two fuel flows in the predetermined ratio are obtained through said respective discharge passages.

4,036,195

UNIT FUEL INJECTOR

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1975, Ser. No. 634,952
Int. Cl.[2] F04B *35/02*; F02M *61/00*
U.S. Cl. 123—139 AK **5 Claims**



1. A unit fuel injection system comprising; housing means having first bore means therein, piston means reciprocatingly mounted within said first bore means and biased to a first position, injection means for selectively communicating fuel from said first bore means to a point of fuel utilization, unrestrained free-floating plunger means slidably mounted within said first bore means between said piston means and said injection passage means, first chamber means formed within said first bore means between said floating plunger means and said piston means, first fluid communication means for communicating first fluid from a first source thereof to said first chamber means; second chamber means formed within said housing means between said unrestrained floating plunger means and said injection passage means; second fluid communication means for communicating a second fluid from a second source thereof to said second chamber means with said piston means in a first position;

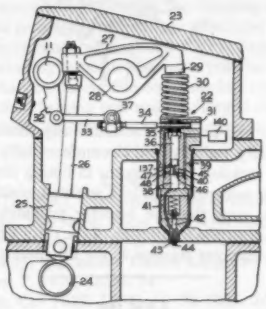
said piston means including a piston member, biasing means for urging said piston member in a first direction away from said injection passage means to said first position, and cam means operable for periodically urging said piston member in a second direction toward a second position allowing said piston member to block said second communication means immediately upon movement from said first position.

4,036,196

SPRING LOADED LEVER TO OPERATE CONTROL RACK OF FUEL INJECTOR

William I. Hamilton, deceased, late of Chicago Heights, Ill. (by Edna L. Hamilton, joint tenancy for the estate), assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 25, 1975, Ser. No. 607,602
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 R **8 Claims**



1. A fuel injection control on a diesel engine for controlling a plurality of fuel injectors comprising, an engine driven governor, a speed responsive member driven by said governor responsive to engine speed, a plurality of fuel injectors each including a fuel injection plunger, a fuel injection control rack, a metering pinion on each of said fuel injection plungers for metering fuel injection, means defining a fuel injection pump including said fuel injection plunger defining a land forming at least one helical edge and a port to selectively vary quantity of fuel injection in response to rotation of said plunger, at least one governor control shaft, a collar defining an axial slot mounted on said control shaft, a fuel injection control arm mounted on said governor control shaft and connected to said fuel injection control rack, said control arm defining a lug received in said slot, said lug defining an angular width of less than the width of said slot to provide a lost motion connection between said collar and said lug, resilient means resiliently biasing said lug for an engaging position on one side of said slot to provide positive increase of quantity of fuel injection and permitting relative movement between said governor control shaft and control arm when fuel quantity is decreased.

4,036,197

AUTOMOTIVE IGNITION DISTRIBUTOR CONVERSION MEANS

Craig S. Beshore, 753 Puma Canyon Lane, Glendora, Calif. 91740

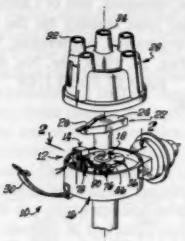
Filed Nov. 3, 1975, Ser. No. 628,415
Int. Cl.[2] F02P *7/02*
U.S. Cl. 123—146.5 A **13 Claims**

1. A universal retro-fittable ignition timing detector mounting bracket for an automotive ignition distributor of the kind having a body mounting a timing rotor with ignition timing elements uniformly spaced about its circumference and a timing element detector to be located in timing element sensing relation to the rotor wherein the detector senses and provides electrical ignition timing pulses in response to rotation of said timing elements past said detector, said bracket comprising:

a first relatively fixed base part including means for securing said part to the distributor body with a given axis of said part parallel to and spaced laterally from the turning axis of the timing rotor,

a second relatively adjustable part for mounting said timing detector, and

adjustable means movably mounting said second part on said first part for selective independent adjustment of the second part relative to the first part in both longitudinal directions of said given axis and any lateral direction of



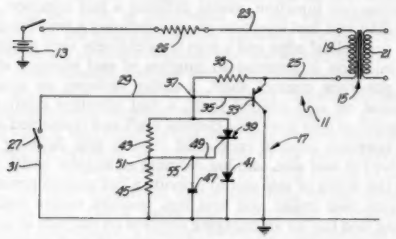
said given axis to permit selective adjustment of said detector axially, radially, and circumferentially of the timing rotor for locating said detector in timing element sensing relation to said rotor and in a selected position about the rotor axis, such that the detector provides said ignition signals in response to rotation of the rotor timing elements past a given point relative to the distributor body.

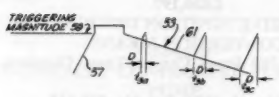
4,036,198

IGNITION SYSTEM WITH PROGRAMMABLE DWELL

Homer E. Howard, 2024 Paloma Drive, Costa Mesa, Calif. 92627

Filed Oct. 17, 1975, Ser. No. 623,486
Int. Cl.² F02P *1/00*
U.S. Cl. 123—146.5 A **9 Claims**





1. An engine ignition control system electrically connectible to an ignition circuit which includes a source of electrical energy, an ignition coil, and timing means for repetitively and alternately providing first and second timing signals with the interval between adjacent timing signals being related to engine speed, said control system comprising:

means responsive to one of the first timing signals for providing a triggering signal a variable interval after said one timing signal and before the next to occur of the second timing signals subsequent to said one timing signal with the variable interval reducing with increases in engine speed;

switch means responsive to said triggering signal for completing a first circuit from the source of electrical energy through the coil to charge the coil; and

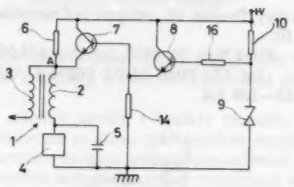
said switch means including means responsive to the next to occur of the first timing signals subsequent to said one timing signal to open said first circuit to discontinue the charging of the coil whereby the coil can be charged during charging interval which extends from about the time of the initiation of the triggering signal to about the time of said next to occur of the first timing signals and said coil is not being charged during said variable interval of time.

4,036,199

DEVICE FOR PROTECTING AN IGNITION DEVICE FOR MOTOR VEHICLES

Louis Jean Chateau, Rosny-sur-Bois, France, assignor to Ducellier & Cie, Paris, France

Filed Mar. 16, 1976, Ser. No. 667,465
Claims priority, application France, Mar. 18, 1975, 75.08332
Int. Cl.² H05B *37/02*
U.S. Cl. 123—148 E **3 Claims**



1. An internal combustion engine ignition system comprising an ignition coil having primary and secondary windings, a control device for the ignition coil, a current limiting resistor, the primary winding, control device and the current-limiting resistor being connected in series between a pair of supply terminals, and a circuit for short-circuiting the current-limiting resistor when the voltage on the supply terminals is less than a predetermined value, said circuit comprising a zener diode and at least one resistor connected in series between the supply terminals, said zener diode conducting when there is a voltage in excess of said predetermined value on the supply terminals, a first transistor having its base connected to one electrode of the zener diode a second transistor of which the emitter-collector junction is connected across the current-limiting resistor, the base of the second transistor being connected to one of the electrodes of the first transistor so that said second transistor is conductive when the zener diode is non-conductive.

4,036,200

CAPACITOR DISCHARGE IGNITION CIRCUIT

Andrew Kuehn, III, St. Paul, Minn., assignor to Systematics, Inc., St. Paul, Minn.

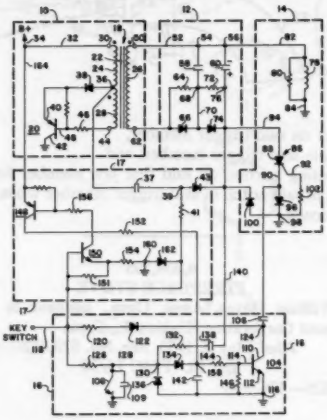
Continuation of Ser. No. 516,584, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 394,759, Sept. 6, 1973, abandoned, which is a continuation of Ser. No. 216,528, Jan. 10, 1972, abandoned, which is a division of Ser. No. 62,398, Aug. 10, 1970, Pat. No. 3,654,910. This application Sept. 11, 1975, Ser. No. 612,369
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **2 Claims**

1. In a capacitive discharge ignition circuit of the type including an ignition coil, a direct current source including a storage battery, a set of distributor points a capacitive energy storage circuit coupled to said battery, an electronic switching means for coupling said energy storage circuit to said ignition coil each time said electronic switching means is triggered, a trigger circuit coupled to said electronic switching means for normally producing trigger signals for operating said elec-

tronic switching means each time the distributor points open, and an ignition key switch terminal coupled to said direct current source, and comparator means for preventing the triggering of said electronic switch means after the key switch has been opened comprising:

a. a first and a second semiconductor amplifier circuit each having a pair of output electrodes and a control electrode;

b. means coupling said pair of output electrodes of said first semiconductor amplifier in series between one terminal of said battery and said trigger circuit;



c. means connecting the output electrodes of said second semiconductor amplifier between the control electrode of said first semiconductor amplifier and the other terminal of said battery; and

d. means connecting the control electrode of said semiconductor amplifier to said key switch terminal, whereby said comprising means is operable for inhibiting said trigger circuit from producing said trigger signals when the voltage from said source of direct current falls below a predetermined threshold following the opening of said key switch.

4,036,201

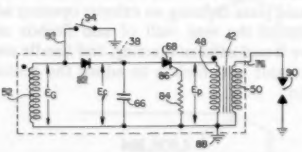
SINGLE CORE CONDENSER DISCHARGE IGNITION SYSTEM

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Apr. 29, 1975, Ser. No. 572,908

Int. Cl.[2] F02P *3/08, 3/06*

U.S. Cl. 123—148 CC **5 Claims**



1. A capacitor discharge system for an internal combustion engine comprising a permanent magnet means rotated about a circular path in synchronism with the operation of said engine, a core of ferromagnetic material mounted adjacent said circular path and having one portion providing a path for the varying flux generated by the movement of said magnet means past said core, a charging winding and a transformer core portion, said charging winding being offset from said primary and secondary windings radially with respect to said circular path; said charging winding and primary winding being wound on said one core portion such that the voltages induced therein by said varying flux each includes half wave voltages of opposite polarity, a charging circuit including a capacitor connected across said charging winding and a diode poled to pass half wave voltages of one polarity for charging said capacitor and maintaining said capacitor charged when the voltage generated in said charging winding is opposite said one polarity, circuit means connecting said capacitor with said primary winding for discharging said capacitor through said primary winding and including an electronic switch means having anode, cathode and control electrodes, the anodecathode junction of said switch means interconnecting the ends of said charging winding and said primary winding which are simultaneously at the same polarity, said control electrode being connected to the other end of said primary winding, the polarity of which is opposite said same polarity, said switch means being nonconductive during the charging of said capacitor by said one polarity of the voltage generated in said charging coil and being rendered conductive by voltage generated in the primary winding opposite said same polarity whereby said capacitor is charged during one complete half cycle of voltage generated in the charging coil and discharged during the next half wave voltage generated in said charging winding.

4,036,202

INTERNAL COMBUSTION ENGINES

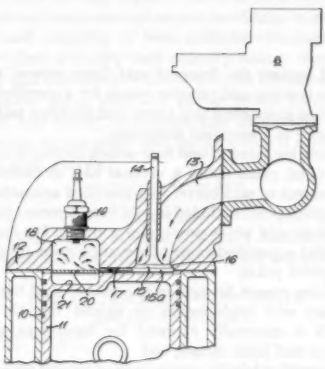
Henry Weslake, Maryland, Point Hill, Rye, England

Filed Aug. 20, 1975, Ser. No. 606,092

Claims priority, application United Kingdom, Aug. 23, 1974, 37194/74; Nov. 7, 1974, 48231/74

Int. Cl.[2] F02B *17/00, 19/00;* **F01L** *3/22*

U.S. Cl. 123—32 ST **12 Claims**



1. An internal combustion engine having at least one cylinder containing a reciprocable piston, an inlet passage for air or air/fuel mixture leading to the engine cylinder, means to ignite the air/fuel mixture, a branch passage leading from the inlet passage to the ignition means to deliver air or air/fuel mixture thereto, and a single valve for opening and closing both the inlet and branch passages, the valve having a first position for closing both said inlet and branch passages, a second position for opening said branch passage and closing said inlet passage, and a third position for opening both said branch and inlet passages.

4,036,203

ELASTIC BAND TYPE TOY CANNON

Clyde H. Chapman, 9535 Yorkwood, Houston, Tex. 77016

Filed Dec. 5, 1975, Ser. No. 638,181

Int. Cl.[2] F41B *7/00*

U.S. Cl. 124—21 **4 Claims**

1. A toy cannon which comprises;

an elongate hollow barrel having a breach end and a muzzle

end, there being a lengthwise slot extending along a substantial portion of said barrel and terminating short of said muzzle end;

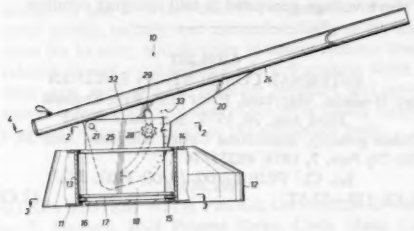
a transversely extending projectile plunger slidably received within said barrel;

an outwardly projecting, protruding tabular means carried on said plunger and extending to the exterior of said barrel through the lengthwise slot in said barrel;

an elongate resilient force means adapted to be joined at one end to a fixed point relative to said barrel and at the other end to said protruding tabular means to impart axial movement to said plunger along said barrel; said force means being housed in cowling means extending along substantially the full length of the barrel and afixed to the outer surface of said barrel;

a pivot point near the breach end of said barrel;

a latch means pivotly mounted on said pivot point, said latch means incorporating a hook which engages and holds said plunger when said plunger is forced to the rear of said



barrel against the force of said force means, said latch means holding said plunger means for a specified interval;

base means supporting said barrel and enabling said barrel to be aimed in a specified direction;

a turntable included in said base which rotates in a generally horizontal plane about a vertical axis to thereby permit adjustment of said barrel to a specified azimuthal angle;

a fixed pivot point included in said base, a means joining said barrel to said pivot point, and a means for locking said barrel at a specified angle of elevation upon rotation about said pivot point;

an opening means formed in the side of said barrel which permits said latch means to extend therethrough and which is externally exposed for hand manipulation to release said latch means; and

two protruding tabular means carried on said plunger which are arranged diametrically opposite of one another and wherein said barrel has a pair of lengthwise opposing slots, said tabular means protruding respectively through opposing slots.

4,036,204

TRIGGER RELEASE DEVICE FOR BOW STRINGS

Joseph D. Scott, 2112 S. Fernwood Drive, Savannah, Ga. 31404

Filed Dec. 10, 1975, Ser. No. 639,353

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—35 A **4 Claims**

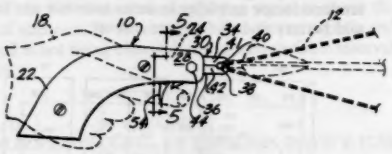
1. In a release device for the bow string of a bow which is used to propel an arrow:

a handle,

a pair of first and second opposed jaws pivotally mounted on said handle and each of said jaws having a cavity therein so that said jaws when closed together from an opening therebeneath in which a bow string is confined,

a first jaw member including said first jaw thereon and a second jaw member including said second jaw thereon, said first and second jaw members each being elongated and having a respective first pivot connected by first pivot means therebetween, said first pivot means mounting said first and second jaw members on said handle,

a trigger member having a pivot attaching portion and there being second pivot means pivotally connecting the pivot attaching portion of said trigger member with said second jaw member,



a trigger on said trigger member,

a notch in said trigger member, and

a projecting portion on said first jaw member for engagement in said notch in said trigger member when said jaws are closed.

4,036,205

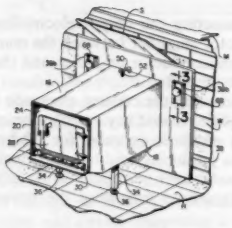
FIREPLACE STOVE

Robert William Hayes, Avon, Conn., assignor to Hayes-Te Equipment Corporation, Unionville, Conn.

Filed May 2, 1975, Ser. No. 573,872

Int. Cl.[2] F24C *15/30*

U.S. Cl. 126—126 **10 Claims**



1. A fireplace stove comprising a generally planar flat plate of such a size that marginal portions are adapted to overlie the sides of a fireplace opening, a hollow rectangular firebox structure which includes a horizontal top and vertically extending side walls, said firebox structure having a rear wall supported by said plate and having a bottom wall and a front wall defining an access opening, an access door in said opening, said front wall further including an air inlet opening adjacent the lower portion of said front wall, a side valve for metering flow of inlet air, said plate defining an exhaust opening adjacent the upper portion of the rear wall of said firebox structure, a damper valve is said exhaust opening, and handle means accessible from outside said firebox to adjust the position of said damper valve.

4,036,206

SELECTIVE SOLAR ENERGY ABSORPTION

John Frederick Straub, Aston, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1976, Ser. No. 710,096

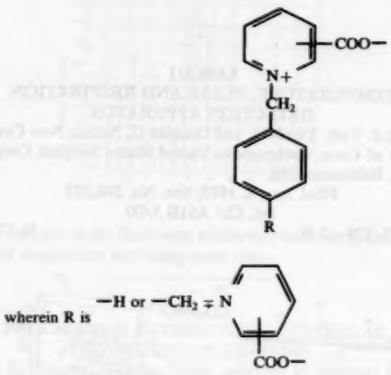
Int. Cl.[2] F24J *3/02;* **C25D** *3/56, 5/48;* **B23P** *3/00*

U.S. Cl. 126—270 **10 Claims**

1. In a process for the selective absorption of solar energy wherein the ratio at 120° C (250° F) of absorptivity of the surface for solar energy, α_s, to black body radiation emissivity, ϵ_B, of the surface with respect to heat energy is at least 5:1, the improvement comprising

absorbing the solar energy on a blackened white brass elec-

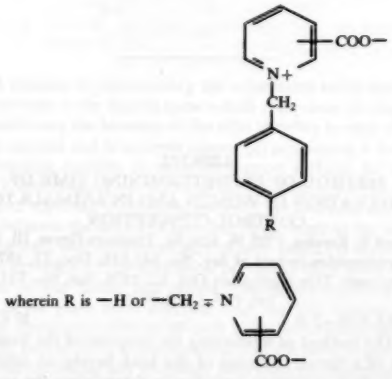
troplated surface in which the electroplate contains about 0.5 to 20% by weight copper, balance zinc, and which electroplate has been prepared by the electrolytic deposition of bright white brass from an alkaline cyanide electroplating bath containing dissolved therein zinc, copper, cyanide and, in an amount to yield a metal deposit of improved brightness, at least one brightener which is an inner salt of a quaternized pyridine carboxylic acid having the general formula:



and which bright white brass electroplate has been blackened by contact with an oxidizing acid solution containing 0.1% to 10% by weight nitric acid.

6. An apparatus for the selective absorption of solar energy wherein the ratio at 120° C (250° F) of absorptivity of the surface for solar energy, α_S, to black body radiation emissivity, ϵ_B, of the surface with respect to heat energy is at least 5:1, the improvement comprising

the absorber on which the solar energy is absorbed being a blackened white brass electroplated surface in which the electroplate contains about 0.5 to 20% by weight copper, balance zinc, and which electroplate has been prepared by the electrolytic deposition of bright white brass from an alkaline cyanide electroplating bath containing dissolved therein zinc, copper, cyanide, and in an amount to yield a metal deposit of improved brightness, at least one brightener which is an inner salt of a quaternized pyridine carboxylic acid having the general formula:



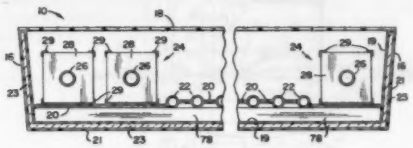
and which bright white brass electroplate has been blackened by contact with an oxidizing acid solution containing 0.1% to 10% by weight nitric acid.

4,036,207

WATER HEATING ASSEMBLY

Clyde W. Bouse, Clearwater, Fla., assignor to General Energy Devices, Clearwater, Fla.

Filed Dec. 11, 1975, Ser. No. 639,983
Int. Cl.[2] F23J 3/02
U.S. Cl. 126—271 **15 Claims**



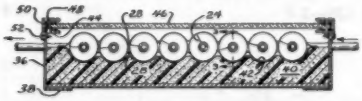
1. A water heating assembly of the type energized by solar energy, said assembly comprising: water storage means, heat collector means including a casing having facing means, said heat collector means further comprising a collector plate including water filled conduit means disposed relative to said casing, said conduit means being disposed in fluid communication with said storage means, primary heater means mounted in fluid communication with said conduit means of said collector plate, said primary heater means including a plurality of heat collector elements mounted in spaced relation along at least a portion of the length of said conduit means, pump means disposed in fluid driving relation between said heat collector means and said water storage means, insulating means disposed between said plurality of heat collector elements and said collector plate whereby said primary heater means is supported by and substantially insulated from direct contact with said collector plate; and said facing means being disposed relative to said casing for transmitting solar radiation to said heat collector means when said facing means is exposed to the source of solar energy.

4,036,208

FINNED TUBE SOLAR ENERGY ABSORBER

Carl F. Bauer, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,119
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **5 Claims**



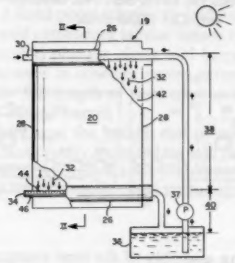
1. A solar energy absorber comprising a plurality of closely spaced, generally parallel, finned tube portions having spaced, radially extending fins whose outer diameter is at least about twice the internal diameter of the tubing and whose height is greater than the space between fins, said plurality of finned tube portions being arranged in a generally planar array, a pair of sheets of plastic film overlying and underlying said finned tube portions, each of said sheets being in tight contact with the respective upper or lower outer peripheral surface of said fins along at least the major portion of the respective upper or lower circumferential portion of each fin, said sheets of plastic film cooperating with the side walls of said fins and the outer surface of the tubing to define a series spaced, substantially closed compartments which limit convection heat loss from said absorber.

4,036,209

ATMOSPHERIC HEAT EXCHANGE METHOD AND APPARATUS

Jack J. Press, 17426 Plaza Destacado, San Diego, Calif. 92128

Filed June 26, 1975, Ser. No. 590,644
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **8 Claims**



1. An atmospheric heat exchanger comprising:

a sealed container having front and rear walls both made of thin, pliable sheet material having substantially the same physical properties and having smooth inner surfaces capable of contacting each other in face-to-face relationship defining therebetween an unrestricted liquid passageway substantially throughout the inner dimensions of said walls, said container walls capable of conforming to the shape of its supporting structure;

said container having liquid inlet and outlet means for circulating a liquid medium through said container;

negative pressure means for maintaining said conformable film walls in close, uniform relation to said other wall to define a liquid passageway therebetween having a minimum thickness;

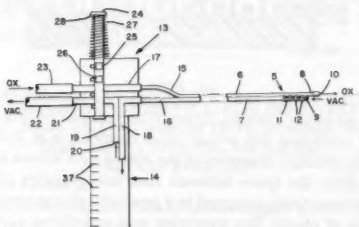
whereby said minimum thickness passageway creates a venturi to uniformly spread the liquid over the entire passageway and to increase the velocity of the liquid flow therethrough to enhance the heat transfer between said walls and said liquid.

4,036,210

DOUBLE LUMENED CATHETER

Roy L. Campbell, 3415 Canterberry St., Greensboro, N.C. 27408, and Steven Loveland, 2904 Shadow Ridge Drive No. 7, Augusta, Ga. 30909

Filed June 9, 1975, Ser. No. 585,067
Int. Cl.[2] A61B *10/00*; A61M *25/00*
U.S. Cl. 128—2 F **4 Claims**



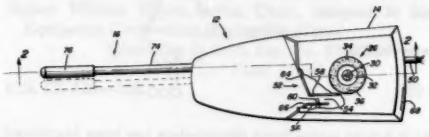
1. A multi-lumened catheter having at least two lumens, one of said lumens being an oxygenation lumen and the other being an aspiration lumen, each of said lumens having an opening therein, and a protuberance whereby the aspiration lumen is spaced by said protuberance from approximate tissue surfaces, said lumens having a common flow control means in communication therewith and having multiple flow positions for controlling independently or simultaneously the flow through said lumens, said control means having a plunger means, said plunger means having a locking tab member affixed thereto for locking said plunger means into the desired flow position for controlling the flow through said lumens.

4,036,211

TEMPERATURE, PULSE AND RESPIRATION DETECTION APPARATUS

George J. Veth, Fairfield, and Douglas G. Noiles, New Canaan, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Filed Apr. 8, 1975, Ser. No. 566,073
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 R **36 Claims**



1. An apparatus for sensing temperature, pulse and respiration comprising a housing and a probe extending from said housing so that when the probe is placed in a patient's mouth the patient's lips are adapted to contact at least a portion of the housing, temperature sensor means mounted on said probe for insertion into the mouth, photoelectric pulse sensor means mounted on said housing and positioned to be contacted by tissue through which blood is circulating, respiration sensor means mounted in said housing and positioned to be in the path of nasal air flow when said probe is inserted into the mouth, said housing having an opening for exposing said respiration sensor means to said nasal air flow, and a disposable cover for removably covering said probe and at least a portion of said housing comprising a radiation-transmitting portion adapted to associate with said photoelectric pulse sensor means and an opening adapted to associate with said respiration sensor means.

4,036,212

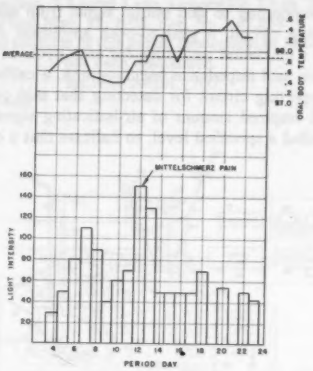
METHOD OF PREDETERMINING TIME OF OVULATION IN WOMEN AND IN ANIMALS TO CONTROL CONCEPTION

Richard F. Karuhn, 1705 W. 61st St., Downers Grove, Ill. 60515

Continuation-in-part of Ser. No. 643,036, Dec. 22, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,348
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 R **10 Claims**

1. The method of monitoring the progress of the ovulation cycle of a female mammal of the kind having an ovulation cycle which comprises periodically determining the concentration of ATP in the mammal's vaginal fluid over the period

of desired investigation by measuring the intensity of light resulting from the reaction of the ATP content of periodically



taken samples of the fluid with luciferase/luciferin in the presence of magnesium and manganese ions.

4,036,213

PROCESS FOR DETERMINING VERTEBRAE LOCATIONS IN HUMANS

Ralph R. Gregory, Monroe, Mich., assignor to National Upper Cervical Chiropractic Research Association, Inc., Monroe, Mich.

Filed May 3, 1976, Ser. No. 682,519
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—2 S **2 Claims**

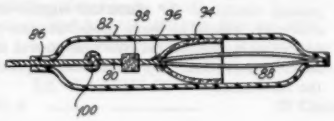
1. A process for determining the adjustment to be made to the vertebrae in the human spine which comprises the steps of (1) establishing the location of the atlas vertebra in each of the lateral, sagittal and transverse planes, (2) positioning a human in a standing position on separate support surfaces for each foot, (3) determining the width of the uppermost part of each ilium and adjusting the spacing between the feet such that the width between the center of each heel is the same as the width between each said uppermost part of each ilium, (4) determining the deviation of the uppermost portion of each ilium from the axis of the lateral and sagittal planes, (5) adjusting the height of the plane upon which at least one foot is supported unti the uppermost portion of each ilium lies substantially in the same lateral plane and substantially in the same horizontal plane and recording any deviation therefrom (6) adjusting the location of the atlas vertebra, and (7) thereafter determining any deviation from the axis of the lateral and sagittal planes of each ilium when the support surfaces for each foot lie in the same horizontal plane.

4,036,214

FLUID-COLLECTING AND MICROORGANISM-DETECTING DEVICES

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Filed Apr. 14, 1975, Ser. No. 568,139
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 F **14 Claims**



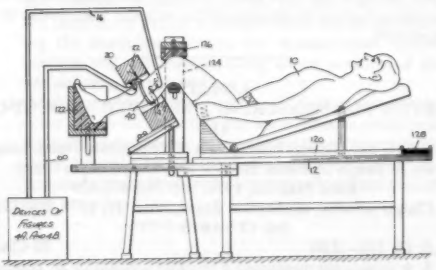
1. In a device for collecting body fluids and/or detecting whether or not certain microorganisms are present in a body cavity, an enclosure having a hollow interior and adapted to be introduced into the body cavity, transfer means extending through a wall portion of said enclosure from the exterior to the interior thereof for automatically transferring a body fluid from the exterior to the interior of said enclosure in response to contact of said transfer means with a body fluid in the body cavity, and closure means formed at least in part by a portion of said enclosure for closing said enclosure automatically, after transfer of a body fluid into said enclosure by said transfer means, in a manner preventing body fluids and/or microorganisms therein from moving into or out of said enclosure after closure of the latter by said closure means, said closure means including a means for automatically rendering said closure means operable to close said enclosure, so that the transfer of the body fluid from the exterior to the interior of said enclosure and the closing of said enclosure go forward in a fully automatic manner upon introduction of said enclosure into the body cavity.

4,036,215

APPARATUS AND METHOD FOR ELIMINATING PERTURBATIONS OF A KINETIC ORIGIN IN THE BLOOD FLOW WAVEFORM

Henri Georges Doll, New York, N.Y., assignor to Doll Research, Inc., New York, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,630
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 F **15 Claims**



1. An electromagnetic flowmeter apparatus for use in measuring the pulsatile flow in a blood vessel of a living subject, the flowmeter apparatus including means adapted to establish a uniform magnetic field in the vicinity of a limb of a living subject, electrode means adapted to be positioned within the magnetic field in conductive contact with said limb of a living subject for detecting electrical signals generated by pulsatile blood flow in the limb, and means coupled to the electrode

means for producing a blood flow waveform from the signals detected by the electrode means, wherein the improvement comprises:

ballistic pickup means adapted to be positioned on the limb of the living subject in the magnetic field near the attachment location of the electrode means of said flowmeter for producing a signal in response only to movement of the limb and

means having an input coupled to the ballistic pickup means and to the electrode means and an output coupled to the waveform producing means of the flowmeter for adding subtractively the ballistic signal produced by the ballistic pickup means to the electrical signals detected by the electrode means in such proportion as substantially to cancel an undesired ballistic component of a blood flow waveform produced by the waveform producing means of the flowmeter.

4,036,216

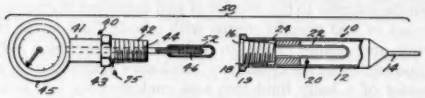
BODY FLUID PRESSURE SYSTEM

Maynard Ramsey, III, 2416 Watrous Ave., Tampa, Fla. 33609

Filed Sept. 4, 1975, Ser. No. 610,389

Int. Cl.[2] A61B 5/02

U.S. Cl. 128—2.05 D **21 Claims**



1. A disposable blood pressure monitor comprising an elongated tubular structure, means on one end of said tubular structure adapted to place the interior of said tubular structure in direct communication with a fluid system to be monitored, a flexible tube shaped membrane received within said tubular structure, said flexible tube shaped membrane separating said tubular structure into first and second chambers, gauge means engaging the other end of said tubular structure, said gauge means being removably in said tubular structure and adapted to place the interior of said tubular structure in a pressure transfer communication with the fluid system to be monitored, said gauge means comprising a plug means, a pressure indicating means mounted to said plug means, a tube means extending through said plug means and communicating with said pressure indicating means, sensor means mounted on said tube means and an incompressible fluid filled sack member secured to said tube means and containing said sensor means, said sack member communicating with said pressure indicating means, and engaging the inner wall of said flexible tube shaped membrane through said tube means placing said gauge means in a pressure responsive communication with the fluid system to be monitored.

4,036,217

DEVICE FOR MEASURING A RESPIRED AMOUNT OF AIR

Ayao Ito, and Akinori Ishida, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

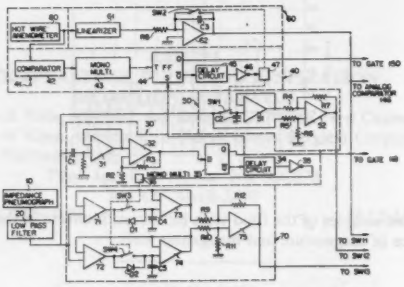
Filed Mar. 31, 1976, Ser. No. 672,439

Claims priority, application Japan, Mar. 31, 1975, 50-38959

Int. Cl.[2] A61B 5/08

U.S. Cl. 128—2.08 **20 Claims**

1. A device for measuring a respired amount of air comprising a respired amount of air-indicating signal generator for detecting an amount of air respired by a body to be measured and generating an electrical signal corresponding to said respired amount of air, an impedance pneumograph for detecting an impedance variation corresponding to said respired amount of air of said body, a reference level setting circuit for receiving an output signal from said impedance pneumograph to set a reference level with respect to said output signal, a memory circuit for receiving, when it is placed in a write-in mode, an output signal from said reference level setting circuit as a writing address signal and storing as information an output signal from said respired amount of air-indicating signal generator corresponding to said output signal from said reference level setting circuit, a peak-to-peak amplitude detector for detecting a maximum amplitude for each cycle of said output signal from said impedance pneumograph, a calibration completion-detecting circuit for detecting that said output signal from said respired amount of air-indicating signal generator has exceeded a specified level, to indicate that a desired calibration signal has been obtained, and an operation mode selecting means for setting, when it has received a calibration completion-indicating output signal from said detecting circuit, said memory circuit to a readout mode and electrically isolating said respired amount of air-indicating signal generator and said reference level setting circuit from said memory circuit and simultaneously coupling said peak-to-peak amplitude detector to said memory circuit, thereby to read out a respired amount of air-indicating information signal stored in said memory circuit by using an output signal from said peak-to-peak amplitude detector as a reading address signal.



4,036,218

ENDOSCOPE

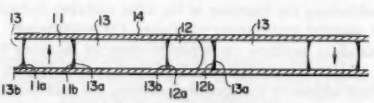
Nobuo Yamashita, Tama; Yoshisada Hayamizu, Hachiouji; Yoshitaka Nagai, Hachiouji; Toshihiro Imai, Hachiouji, and Kazumasa Matsuo, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Dec. 18, 1975, Ser. No. 641,887

Claims priority, application Japan, Dec. 19, 1974, 49-144948; Dec. 19, 1974, 49-144949; Dec. 19, 1974, 49-144950

Int. Cl.[2] A61B 1/00

U.S. Cl. 128—4 **8 Claims**

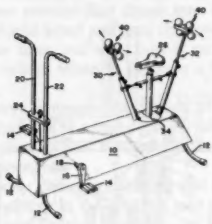


1. An endoscope having an objective side and an eyepiece side and comprising optical elements constituting an image-transmitting optical system and an outer tube for holding said optical elements therein, said image-transmitting optical system being arranged so that respective adjacent surfaces of respective optical elements contact each other and two optical elements positioned at both ends of said outer tube out of said optical elements are respectively fixed to said outer tube.

4,036,219
EXERCISE AND MASSAGING APPARATUS

Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn. 06830

Filed Mar. 17, 1976, Ser. No. 667,634
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—48 24 Claims

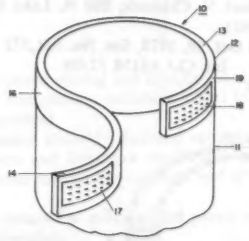


1. An exercise and massaging apparatus comprising in combination:
   a stationary support;
   pedal means including a rotatable pedal shaft mounted to said shaft support;
   a seat supported by said support;
   an arm upstanding from said support and mounted for reciprocating rotational motion about a substantially vertical axis;
   mounting means disposed at the upper portion of said arm for fastening thereto massaging means adapted to engage the torso of a person sitting on said seat, and
   drive means coupled between said pedal shaft and said arm for causing responsive to the operation of said pedal means and rotation of said pedal shaft said arm and massaging means to undergo reciprocating rotational motion.

4,036,220
BODY MEMBER PROTECTIVE DEVICE

Gerald John Bellasalma, 96 Park St., West Caldwell, N.J. 07006

Filed Oct. 15, 1975, Ser. No. 622,517
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—82 10 Claims

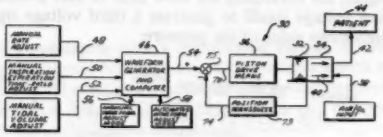


1. In a protective device comprising a flexible tubular body member enclosing means having at least one body member securing means comprising a foam-like cushionable band fixedly mounted upon the exterior surface of one end of the tubular member and having a non-adhered overlapping portion in excess of the circumference of the tubular member, a flexible collar fixedly mounted upon the cushionable band and the overlapping portions thereof, and a body member fastening means adapted to secure the protective device about the body member to be protected, the fastening means comprising a plurality of flexible hooks fixedly mounted upon the overlapping portion of the cushionable material and a plurality of flexible hook engaging loops fixedly mounted upon the cushionable material beneath the overlapping portion, the hooks and loops adapted for rapid and easy engagement and disengagement, the improvement which comprises fixedly mounting the flexible hooks in a recessed section of the overlapping portion of the cushionable material.

4,036,221
RESPIRATOR

Deane Hillsman; Albert M. Cook, and James G. Simes, all of Sacramento, Calif., assignors to Sutter Hospitals Medical Research Foundation, Sacramento, Calif.

Continuation-in-part of Ser. No. 490,183, July 19, 1974, abandoned, which is a continuation of Ser. No. 249,380, May 1, 1972, abandoned. This application Apr. 2, 1975, Ser. No. 564,336
Int. Cl.[2] A61M 16/00
U.S. Cl. 128—145.6 29 Claims



1. A volume-cycled respirator system for delivering a controlled volume of gas to a patient, the system comprising:
   a. displaceable gas delivery means having a position which is adjustable for forcing periodically a volume of gas under pressure into the lungs of a patient throughout an inspiratory period of a respiratory cycle;
   b. drive means operatively connected to the gas delivery means to displace the volume of gas to be delivered;
   c. means for generating a reference signal representing variations in the position of the gas delivery means with respect to time throughout the inspiratory period necessary to deliver a desired volume of gas in accordance with a desired volume-versus-time waveform; and
   d. closed loop feedback means for controlling the instantaneous position of the gas delivery means throughout the inspiratory period, the closed loop feedback means including
      1. first means responsive to the actual position of the gas delivery means for generating a position feedback signal representing the actual volume of gas displaced by the gas delivery means with respect to time throughout the inspiratory period,
      2. second means responsive to said reference signal and said position feedback signal for providing throughout the inspiratory period a position error signal representing the deviation between the instantaneous desired position and the corresponding actual position of the gas delivery means, and
      3. third means for applying said position error signal to the drive means for adjusting the instantaneous position of the gas delivery means in proportion to said error signal throughout the inspiratory period to deliver gas to the patient in accordance with the desired volume-versus-time waveform.

4,036,222
AUTOMATIC ELECTRONIC APPARATUS FOR MEASURING THE BRONCHIAL RESISTANCE AND THE ELASTANCE OF THE PULMONARY TISSUE

Claude Gillard, Brussels, and Marcel Mauroy, Nouvelles, both of Belgium, assignors to Soram S.A., Geneva, Switzerland

Filed Apr. 15, 1975, Ser. No. 568,330
Claims priority, application Belgium, May 8, 1974, 144095
Int. Cl.[2] A61B 5/08
U.S. Cl. 128—2.08 9 Claims

1. Automatic electronic apparatus for measuring and dis-

playing simultaneously the resistance R to air flow through the bronchial tracts and the elastance E of the pulmonary tissue of a subject, the parameters *R* and *E* being included in the known Rohrer equation

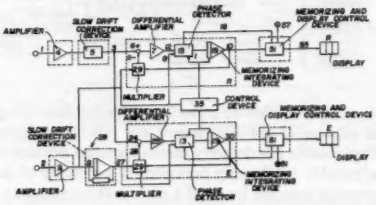
$$p(t) = R\,v(t) + E\,v(t)$$

wherein variables $p(t)$, $v(t)$ and $v(t)$ are instantaneous values, with reference to their mean values, of endothoracic or buccal pressure, buccal or endotracheal air flow, and volume of pulmonary air, respectively, and wherein the variables $p(t)$ and $v(t)$ are convertible to a first voltage signal and a second voltage signal, respectively proportional to the pressure and air flow, said apparatus comprising:

a. first means for preamplifying said first voltage signal;

b. second means for preamplifying said second voltage signal;

c. first means, responsive to said preamplified first voltage signal, for correcting for slow drift of said preamplified first voltage signal to generate a third voltage signal of zero mean value of the pressure;



d. second means, responsive to said preamplified second voltage signal, for correcting for slow drift of said preamplified second voltage signal and for integrating said preamplified second voltage signal to generate a fourth voltage signal of zero mean value of the air volume;

e. first automatic computing means, responsive to said third voltage signal and said preamplified second voltage signal, for generating a fifth alpha voltage signal representing R and a sixth error signal which is cancelled when said fifth voltage signal represents the correct value of R;

f. second automatic computing means, responsive to said third voltage signal and said fourth voltage signal, for generating a seventh beta voltage signal representing E and an eighth error signal which is cancelled when said seventh voltage signal represents the correct value of E;

g. first means, responsive to said fifth and sixth signals, for displaying the correct value of R; and

h. second means, responsive to said seventh and eighth signals, for displaying the correct value of E.

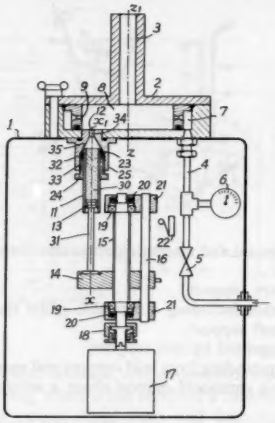
4,036,223

APPARATUS FOR GENERATING AEROSOLS OF SOLID PARTICLES

Jean-Claude Obert, 16, Traverse Saint Pierre, 13100 -Aix-en-Provence, France

Filed Jan. 20, 1976, Ser. No. 650,685
Claims priority, application France, Jan. 29, 1975, 75.03493
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—266 **15 Claims**

1. An apparatus for generating aerosols of solid particles, particularly inhalable aerosols of vaccines, comprising, a micronizer having a cylindrical chamber formed therein, said micronizer having a pair of opposed axial ends by first first and second flat end walls located perpendicular to the longitudinal axis of the chamber and closing the ends of the chamber, one of said first end walls having an axial outlet formed therein to permit aerosol in said chamber to pass therethrough; and a peripheral side wall extending between said end walls, said side wall and said end walls defining said chamber therebetween; said side wall including a plurality of inlet nozzles for compressed gas opening tangential to said longitudinal axis into said chamber; means for introducing compressed gas into said nozzles; means for introducing a determined dose of a pulverulent product, said introducing means comprising, at least one cavity formed in one of said end walls the second of said end walls and radially disposed from said longitudinal axis and communicating with the inside of said chamber through a conduit formed in the second end wall, a syringe associated with said cavity comprising a doser tube containing a determined dose of said pulverulent product, said tube having opposite opened front and rear ends with said front end being axially engaged in its associated cavity; means for removably securing and sealing said open front end of the doser tube within the cavity in which it is engaged; and means for introducing and pushing substantially all of the pulverulent product in said syringe into said chamber through said channel; said pushing means including a plunger slidably positioned in said doser tube and means for pushing said plunger from the rear end of the tube towards the forward open end to urge pulverulent product in the tube through said channel.

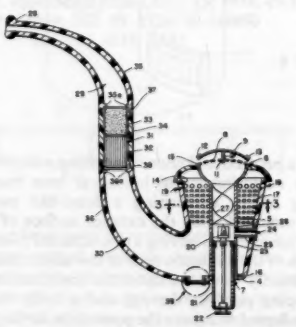


4,036,224

PORTABLE CONDITIONED AIR BREATHING PIPE

Peter N. Choporis, 543 S. Beverly Lane, Arlington Heights, Ill. 60005, and Robert N. Choporis, 880 N. Lake Shore Drive, Chicago, Ill. 60611

Filed Oct. 10, 1975, Ser. No. 621,372
Int. Cl.[2] A61M *15/06*
U.S. Cl. 128—212 **9 Claims**



1. A portable conditioned air breathing pipe adapted to be supported by the mouth of the user comprising:

a. a pipe bowl having a top, sides, and bottom, and a heat

conductive tube running from an opening in the top of said bowl to an opening in the bottom of said bowl, a space surrounding the sides of said tube between the outer surface of said tube and the inner surface of said bowl, said tube having a first open end being sealed with respect to the opening in the top of said bowl and a second open end sealed with respect to the opening in the bottom of said bowl said space between the outer surface of said tube and the inner surface of said bowl forming a heating chamber,

b. heating means mounted to heat said heat conductive tube of (a), said heating means comprising a burner unit having a container tubular fuel fitted into said opening in the bottom of said bowl and into the lower part of said heat conductive tube, and a jet burner on the top of said fuel container which when lit projects a flame upwardly into said tube,

c. passageways between the outside of said bowl and said heating chamber to admit fresh air so that it contacts the heated surface of said heat conductive tube,

d. a mouthpiece, and

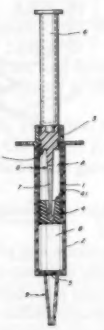
e. a rigid tubular casing connecting said mouthpiece and said heating chamber in the bowl of said pipe so that fresh air heated in said heating chamber can be withdrawn to the mouth of the user.

4,036,225

BICOMPARTMENTAL SYRINGE

Jean-Robert Maury, Le Peycher Montpeyroux de Lonchat (Dordogne), France

Filed Sept. 18, 1975, Ser. No. 614,363
Claims priority, application France, Sept. 19, 1974, 74.31687
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 M **4 Claims**



1. A combined mixing and injecting syringe comprising:

a pair of complentary members joined to form an elongated compartment,

piston means slideably disposed at one end of one of said members and having a needle-like extension extending therefrom toward the opposite end of the said one member,

plunger means for moving said piston means toward said other membrs,

a first diaphragm disposed in the elongated compartment intermediate the ends of the compartment and separating the compartment into two separate and isolated chambers which may each contain a different substance,

and a second diaphragm disposed across said other member to define one end of the compartment,

said needle-like extension of said piston means being positioned in one chamber before operation of said plunger means causes the extension to puncture said first diaphragm,

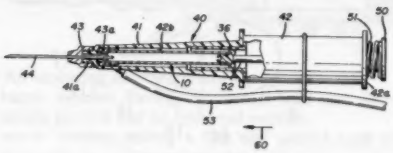
and said extension having means defining an elongated recess extending along a substantial length of said extension toward the tip of the extension whereby communication of materials is permitted between chambers when the first diaphragm is punctured.

4,036,226

CARTRIDGE AND SEALING MEANS THEREFOR

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Continuation of Ser. No. 509,424, Sept. 26, 1974, Pat. No. 3,974,831. This application Mar. 3, 1976, Ser. No. 663,434
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 D **4 Claims**



1. In combination with a hypodermic syringe of the type having a elongate hollow body with a double-ended needle disposed on one end, a movable plunger on the opposed end, and aspirating means disposed adjacent the end carrying the needle, the improvement comprising;

A. a cartridge having

1. an elongate hollow body with a substantially uniform diameter throughout its length and having

a. opposed first and second ends and

b. being receivable within said body of said syringe, with said first end of said cartridge body being disposed adjacent said needle and said aspirating means and said second end being disposed adjacent said plunger;

B. a first unitary resilient seal member

1. received externally on said first end of said cartridge body in sealing relationship thereto and

2. engaging the inner surface of said syringe body in sealing relationship therewith;

C. a second unitary resilient seal member

1. received on said second end of said cartridge body in sealing relationship thereto and

2. engaging the inner surface of said cartridge body in sealing relationship therewith;

D. said first seal member having

1. a main body portion which overlies said first end of said cartridge; and

2. an annular extension extending from said body portion and engaging the outer surface of said cartridge body and the inner surface of said body of said syringe; at least one projecting rib carried by said annular extension for engagement with the inner surface of said body of said syringe.

4,036,227

OSMOTIC RELEASING DEVICE HAVING A PLURALITY OF RELEASE RATE PATTERNS

Alejandro Zaffaroni; Alan S. Michaels, both of Atherton, and Felix Theeuwes, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 354,344, April 25, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 536,006
Int. Cl.[2] A61M *37/00*
U.S. Cl. 128—260 **24 Claims**

1. An oral osmotic device for the controlled dispensing of a unit dosage amount of drug to the gastrointestinal tract, said device comprising;

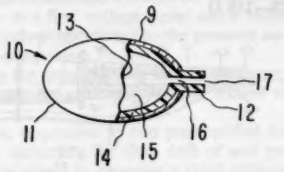
a. a shaped semipermeable wall formed of an inert, nontoxic material that is permeable to the passage of an external gastrointestinal tract fluid, substantially impermeable to

the passage of drug, and maintains its integrity during the drug dispensing period;

b. the wall surrounding and forming a compartment containing a unit dosage amount of drug, said drug being soluble in the external fluid and exhibiting an osmotic pressure gradient across the wall against the fluid when the device is in the environment of use;

c. a layer formed of a nontoxic erodible material on the exterior surface of the semipermeable wall;

d. a passageway communicating with the compartment and the exterior of the device for dispensing drug from the



device and adapted to pass a therapeutically effective amount of drug in the environment of use; and,

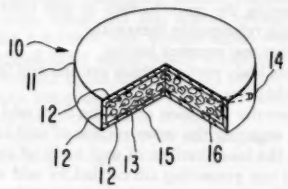
e. wherein in operation when the osmotic device is in the environment of use, the layer erodes at a controlled rate to regulate the amount of fluid available to the wall for imbibition by the osmotic device, with fluid imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate controlled by the permeability of the wall and the osmotic pressure gradient across the wall producing a drug solution that is dispensed from the device through the passageway at a controlled and continuous rate over a prolonged period of time.

4,036,228

OSMOTIC DISPENSER WITH GAS GENERATING MEANS

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Sept. 11, 1975, Ser. No. 612,465
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 **24 Claims**



1. An osmotic device for the continuous dispensing of an active agent to an environment of use, said device comprising:

a. a shaped wall formed of a semipermeable material that maintains its integrity during the dispensing period and which wall is characterized as permeable to the passage of an external fluid in the environment of use and substantially impermeable to the passage of agent;

b. the wall surrounding and forming a compartment containing an active agent and an effervescent couple which couple is soluble in the external fluid and which couple exhibits an osmotic pressure gradient across the wall against the external fluid;

c. a passageway in the wall communicating with the compartment and the exterior of the device for dispensing agent from the device; and

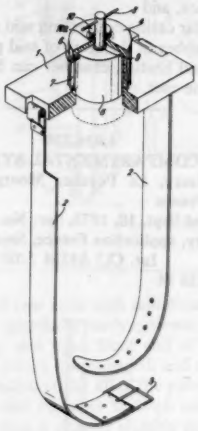
d. wherein in operation with the device in the environment of use, external fluid is continuously imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby wetting the couple which reactively produces an effervescent solution which dispenses agent through the passageway from the device at a controlled rate over a prolonged period of time.

4,036,229

APPARATUS FOR ASSISTING THE TREATMENT OF WOUNDS OR INFLAMMATIONS INTERNAL TO THE HUMAN BODY

Rosolino Marinello, Viale Leonardo da Vinci No. 4, Mantova, Italy

Filed Oct. 24, 1975, Ser. No. 625,708
Claims priority, application Italy, Nov. 6, 1974, 42690/74
Int. Cl.[2] A61F *7/02*
U.S. Cl. 128—268 **4 Claims**



1. Apparatus for treating limited areas of the skin, said apparatus comprising:

a plate of resilient material defining a central hole extending through said plate,

a means for applying continuing pressure to a medicament in contact with the skin at an area of disorder including

a tube on one side of said plate having substantially the same inner diameter as said hole and coaxial therewith

a plug slidably mounted in said hole and tube,

screw means for moving said plug axially of said tube,

cooperating guide means on said tube and plug for guiding said plug during said axial movement, and

belt means connected to said plate for holding said plate against an area of the skin.

4,036,230

MEDICINAL INSERT INSTRUMENT

Kenneth Waldock Adams, 414 Pocatello Road, Middletown, N.Y. 10940

Filed Aug. 18, 1976, Ser. No. 715,319
Int. Cl.[2] A61N *7/00*
U.S. Cl. 128—269 **15 Claims**

1. A hand-held instrument for facilitating the application and/or removal of a medicinal substantially elliptically-shaped insert, to and from an eye, said instrument comprising:

an elongated wand-like stem to be hand-held for applying said medicinal insert to said eye, said wand-like stem having a first end, and a second end opposite said first end; and

an applicator section supported upon said first end of said

wand-like stem for receiving a medicinal elliptically-shaped insert, and for placing said medicinal insert generally upon a sclerotic or eyelid portion of said eye, said applicator section having a relatively weak adhesion surface area generally less than a surface area of said insert, said applicator section having a shape generally conforming to, and aligning with, said substantially elliptically-shaped insert wherein a lateral dimension of said adhesion

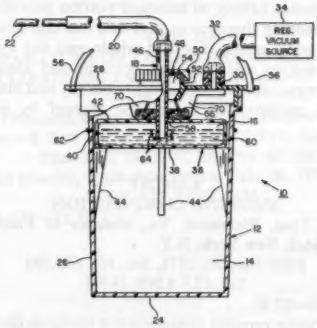
surface is greater than a longitudinal dimension thereof and said longitudinal dimension of said adhesion surface of the applicator member being generally coincident with a longitudinal dimension of said insert, and said lateral dimension of said adhesion surface of the applicator being generally coincident with a lateral dimension of said insert, whereby the substantially elliptically shaped insert may be easily directed into, and placed upon, the eye by said applicator section.

4,036,231

THORACIC DRAINAGE UNIT WITH DEFOAMING MEANS

Larry H. Dodge, St. Charles, and Byron G. Economidy, Manchester, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Nov. 20, 1975, Ser. No. 633,873
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—276 **16 Claims**



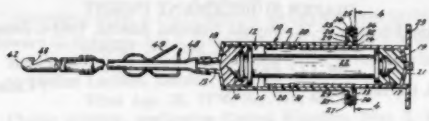
1. A thoracic drainage collection device comprising a container for collecting body fluid having a chamber adapted to receive an initial quantity of liquid therein, fluid passage means having an inlet for fluid communication with a body cavity to be drained, said fluid passage means extending into said chamber and having an outlet disposed below the level of the liquid in said chamber when said initial quantity of liquid is disposed therein so that all gas flowing from said fluid passage means flows into liquid in said chamber, gas outlet means on said container for passing gas out of said container, and defoaming means in said container in the flow path of substantially all gas flowing from said outlet to said gas outlet means.

4,036,232

ASPIRATION DEVICE

Joseph Nicholas Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 19, 1976, Ser. No. 677,950
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—278 **11 Claims**



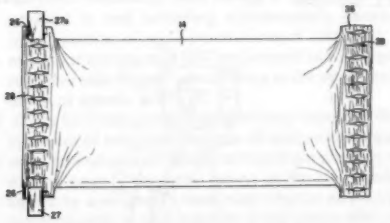
1. An aspirating device comprising:
a barrel member having an internal wall and defining a nozzle portion and an open end portion;
a piston member having a first and second head portion receivable in said barrel member;
a first sealing element carried by said first piston head portion at one end engageable with said internal wall;
a second sealing element carried by said second piston head portion and disposed at another end;
a hollow telescoping member having a closed end portion constructed and arranged to fit within the confines of said barrel member and in sealing engagement with said second sealing element;
holding means operatively associated with said telescoping member and said barrel member to retain said telescoping member in a fixed position when said telescoping member is moved in a direction away from said nozzle portion; and
means operatively associated with said nozzle portion to temporarily close said nozzle portion to the atmosphere.

4,036,233

FLEXIBLE WAIST DIAPER

Theodore Fredrick Kozak, Manchester, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 2, 1976, Ser. No. 702,220
Int. Cl.[2] A41B *13/02*; A61F *13/16*
U.S. Cl. 128—287 **19 Claims**



1. A disposable diaper having a stretchable waistband comprising in combination, a topsheet for placement adjacent to the body and being provided with means for passing liquid therethrough, a water impermeable backsheet and an absorbent pad disposed between said topsheet and backsheet, one of said topsheet or backsheet being a stretchable plastic film having a Young's Modulus of less than 5000 lbs/in^2 and which exhibits recovery characteristics such that at up to 20% elongation it will recover about 99% and from 20 to 50% elongation it will recover from 99 to 90% respectively and still maintain a force of not less than 0.05 lbs, the other of said topsheet or backsheet being fabricated from a non-stretchable material, said topsheet and backsheet having end portions extending beyond said absorbent pad in diaper length direction, said stretchable plastic film constituting said topsheet or backsheet being adhered to said non-stretchable material in said end

portions to form a reinforced stretchable waistband for said diaper, said non-stretchable material in said end portion being provided with openings in an amount and frequency such as to permit effective stretching of said waistband, and fastening means secured to opposing corners of said waistband on one of the end portions of said diaper.

4,036,234

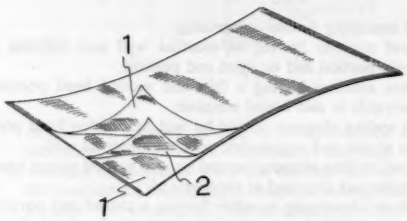
DIAPER SUPPLEMENT INSERT

Haruo Ishizuka, 9-15, Ohyada 3-chome, Adachi, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 764,455

Int. Cl.[2] A61F *13/16;* A41B *13/02*

U.S. Cl. 128—287 **7 Claims**



1. A diaper supplement comprising:

a. a plurality of fine-mesh water-repellent tricot-like cloths substantially oblong in shape;

b. coarse water-absorbent gauze like cloths of the same size as (a), interlarded between said water-repellent cloths; and

c. a waterproof cloth of about the same size as said water-repellent and water-absorbent cloths;

said water-repellent cloths, said water-absorbent cloths and said waterproof cloth being adhered to each other along the long sides at both edges.

4,036,235

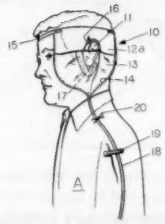
DRAINAGE DEVICE FOR EAR IRRIGATION

Lucille Hathaway, 4855 Monroe St., Lot 612, Toledo, Ohio 43623

Filed June 4, 1975, Ser. No. 583,587

Int. Cl.[2] A61F *11/00, 13/00*

U.S. Cl. 128—292 **2 Claims**



1. Drainage device for ear irrigation comprising

a. receptacle having a flat flexible inner wall and a somewhat eider outer flexible wall secured at its side edge portions to said inner wall expand outwardly to form a basin,

b. an upward extension on said inner wall, providing a substantial head-engaging portion above the upper edge of said outer wall,

c. strap attaching means on the upper part of said extension embracingly to engage the patient's forehead,

d. a vertically elongate opening of generally diamond shape in said inner wall and extending into said extension and enabling the patient's ear to be slipped therethrough so that the upper edge of said basin is approximately level with the meatus of the auditory canal, and

e. a discharge tube leading from the bottom of said basin.

4,036,236

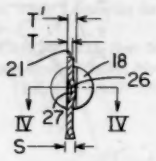
SURGICAL SAW

Earl H. Rhodes, Jr., Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Oct. 6, 1975, Ser. No. 619,580

Int. Cl.[2] A61B *17/14;* B27B *33/02*

U.S. Cl. 128—317 **2 Claims**



1. In a surgical saw having a handpiece, a chuck on said handpiece and drive means for effecting reciprocating movement of said chuck axially thereof, the combination comprising:

elongated, relatively thin blade means having sidewardly offset saw teeth along one lengthwise edge thereof and an integral offset portion extending lengthwise of said blade means throughout the length thereof and disposed intermediate between and spaced from the lengthwise edges thereof, the overall thickness of said blade means, as measured across the offset portion, being no greater than the thickness as measured transversely across the offset toothed edge;

said offset portion being of a shallow V-shaped configuration and projecting outwardly of said blade means from only one side thereof, the other side of said blade means having a shallow groove formed therein as defined within said offset portion, said offset portion and the remaining portions of said blade means, except for the toothed edge, being of a substantially uniform material thickness; and

shank means rigidly and fixedly secured to one end of said blade means and projecting longitudinally thereof, said shank means having an enlarged portion provided with a slot extending thereacross, and said one end of said blade means being snugly disposed within said slot and fixedly connected to said enlarged portion, said shank means being engageable by said chuck whereby said blade means can be reciprocated lengthwise thereof by said drive means.

4,036,237

SMOKING COMPOSITION

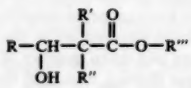
Lina Chen Teng, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,691

Int. Cl.[2] A24B *15/04*

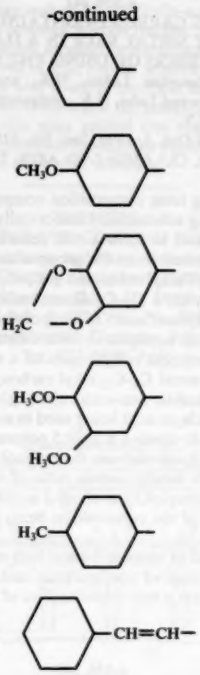
U.S. Cl. 131—17 R **5 Claims**

1. A smoking product comprising a smoking material and from at least 0.0001 percent by weight based on said smoking material, of a beta-hydroxy ester having the formula:



wherein R may be a member selected from the group consisting of:

-continued



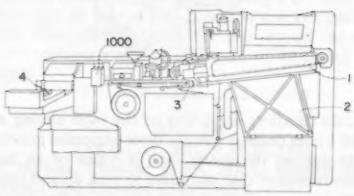
wherein R' is a lower alkyl group, particularly methyl or ethyl; wherein R'' is a lower alkyl group, particularly methyl or ethyl; and wherein R''' is a member selected from the group consisting of H, M, which may for example be an alkaki metal such as sodium or potassium, and alkyl containing from 1 to 8 carbon atoms, for example, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec.-butyl, isobutyl, tert.butyl, n-amyl, n-hexyl, n-heptyl and n-octyl.

4,036,238

APPARATUS FOR CONTROLLING AMOUNT OF TOBACCO FILLER IN CIGARETTE MANUFACTURING MACHINE

Yutaka Okumoto, Oyama Higashi, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,893
Claims priority, application Japan, Feb. 10, 1975, 50-16327
Int. Cl.[2] A24C *5/34*
U.S. Cl. 131—21 B **8 Claims**



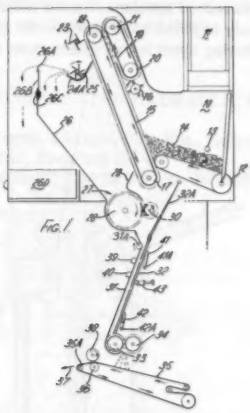
1. An apparatus for controlling an amount of a tobacco filler as it is conveyed by a conveyor in a cigarette manufacturing machine, comprising detecting means for detecting an amount of a tobacco filler and transmitting an electrical signal corresponding to the amount detected, integrating means for integrating said electrical signal, an electrical servo valve operative in response to said integrated electrical signal from said integratng means, a hydraulic piston means actuated by said electrical servo valve, a trimming hydraulic means coupled to said piston means and moving in response to the movement of said piston means and a negative feed back means for feeding back an electrical signal corresponding to a displacement of the trimming means to the electrical servo valve to control the movement of the piston means.

4,036,239

HOPPER FOR A CIGARETTE MAKING MACHINE

Edward G. Preston; Jan A. Rakowicz, both of London, England, and Francis A. M. Labbe, Neuilly-sur-Seine, France, assignors to Molins Limited, London, England

Filed Apr. 28, 1976, Ser. No. 681,097
Claims priority, application United Kingdom, May 2, 1975, 18394/75
Int. Cl.[2] A24B *1/02, 7/14*
U.S. Cl. 131—109 R **15 Claims**



1. A cigarette machine hopper comprising:

a. a first continuous band extending along a predetermined path and having an operative run along said path;

b. a second continuous band having a further operative run adjacent to and extending approximately parallel to at least a portion of said operative run of said band;

c. means for driving said first and second bands respectively such that said operative runs move in the same direction at different speeds; and

d. means for feeding particulate tobacco onto said first band upstream of said operative run of said second band;

e. said first and second bands each having a plurality of spike means thereon, the spike means of the two bands being angularly arranged to tease said tobacco and stretch any lumps therein as said tobacco is fed along said path between said confronting surfaces of said operative runs.

4,036,240

SMOKING APPARATUS WITH REPLACEABLE FILTERING CARTRIDGE

Joseph E. Murray, Jr., 27 Alpine St., No. 16, Malden, Mass. 02148

Filed Dec. 16, 1974, Ser. No. 533,244
Int. Cl.[2] A24F *1/30*
U.S. Cl. 131—173 **6 Claims**

1. A smoking apparatus comprising:

A. a pipe bowl,

B. a hollow pipe stem,

C. a pipe body, said body including a detachable base portion and means for detachably connecting said portion to the remainder of said body and further including a re-

placeable filtering cartridge, disposed within said base portion, said cartridge having a top member and comprising:

1 a means for containing a predetermined volume of liquid filtering agent therein,

2 first smoke port means providing a first smoke port,

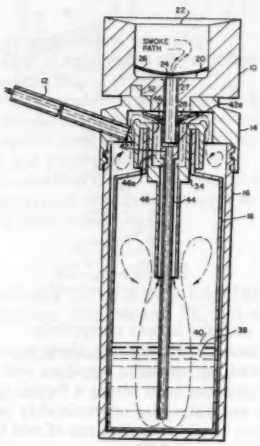
3 a first tubular extension member, attached to and extending from said first port means to a point interior to said cartridge,

4 second smoke port means providing a second smoke port, and

5 a second tubular extension member attached to and extending from said second port means to a point interior to said cartridge, and

wherein said first tubular extension member is adapted to extend into said liquid filtering agent only when said cartridge is substantially upright, and to extend only to points located above the top surface of said liquid filtering agent otherwise, and

wherein said second tubular extension member is adapted to extend only to points located above the top surface of said liquid filtering agent for all orientations of said cartridge, and



wherein said first and second port means are integrally attached to said top member, and wherein further said first port means and first tubular extension member are substantially coaxial with and disposed within said second port means and second tubular extension member, said first and second port means being integrally attached by one or more radially extending struts,

D. connecting means for interconnecting said bowl, stem and body to provide a smoke path when said smoking apparatus is upright from the lower interior portion of said bowl to the bore of said stem, said path between said bowl and stem sequentially including:

1. the interior regions of said first port means and said first tubular extension member,

2. the interior region of said cartridge below said top surface,

3. the interior region of said cartridge above said top surface,

4. the interior regions of said second tubular extension member and said second port means, and

5. the interior region of said body between said cartridge and said body.

4,036,241

FILM-FORMING CARBOXY-CONTAINING RESIN AND A POLYVALENT METAL SALT IN A HAIR SPRAY AND A METHOD OF USING THE SAME

Gerhart Karg, Pompton Lakes, N.J., and Christopher D. Vaughan, Greenwood Lake, N.Y., assignors to Avon Products, Inc., Suffern, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,469

Int. Cl.[2] A45D *7/00*; A61K *7/11*

U.S. Cl. 132—7 **20 Claims**

1. A hair setting resin composition comprising an alcoholic medium containing substantially uniformally dispersed therein an amount sufficient to form a hair retaining film of a film-forming resin selected from the group consisting of (1) a copolymer of a vinyl alkyl ether and a C_1–C_5 alkyl half-ester of maleic anhydride, (2) a C_2–C_6 alkene/maleic anhydride half-C_1–C_5 ester copolymer, and (3) a copolymer of a vinyl ester and acrylic acid or an alpha or beta-substituted acrylic acid wherein said substituent is hydrogen or a single C_1–C_3 alkyl, and a polyvalent metal C_5–C_{20} alkyl carboxylic acid salt capable of forming a stable, non-toxic, clear, glossy film with said resin; the anhydride or acid being used in an amount sufficient to form said resin to contain at least 5 percent by weight of free carboxylic acid groups therein; the amount of salt being sufficient to contain a stoichiometric ratio of metal to free polymeric carboxyl group of from about 1 to 10 to less than 1 to 1; the resultant pH of the composition being between about 3.5 and 7.5.

15. The method of shaping human hair comprising forming the hair into the desired configuration and applying an effective amount to form a hair retaining film of the composition of claim **1** thereto.

4,036,242

HOPPER PAYOUT FOR VARIOUS COIN DENOMINATIONS

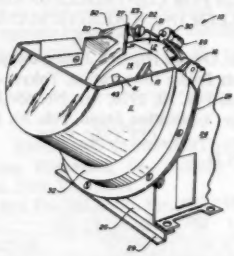
Charles T. Breitenstein, Elk Grove Village, and Frank G. Nicolaus, Chicago, both of Ill., assignors to Spiral Step Tool Company, Elk Grove Village, Ill.

Continuation of Ser. No. 384,624, Aug. 1, 1973, Pat. No. 3,942,544. This application Dec. 15, 1975, Ser. No. 640,631

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.[2] G07D *3/14, 9/00*

U.S. Cl. 133—4 R **11 Claims**



1. In a coin handling apparatus of the type having a coin hopper with a coin outfeed passage directing coins gravitationally in bulk against the lower face portions of an inclined rotating coin transport disc operative to pick up and transport coins seriatim to a region in the upper level of disc travel, the improvement comprising:

means supporting said disc for rotation in a fixed plane of inclination confronting said outfeed passage by antifriction bearing means including at least three rotative bearing members respectively supportively engaging with peripheral margins of the disc at points spaced apart thereabout substantially equidistantly,

at least two of said bearing members being situated adjacent

the lower portion of said disc which is proximate to said outfeed passage and an eccentrically-acting loading effect of bulk coins pressing against the disc thereat,

another said bearing member being situated in the region of said upper level of disc travel, whereby the interengagement between said bearing members and peripheral portions of the disc is such that the imbalanced loading effect of the bulk coin mass against one region of the disc is alleviated to constrain the disc for rotation in a fixed plane relative to the hopper as aforesaid.

4,036,243

APPARATUS FOR COOLING HOT SLABS

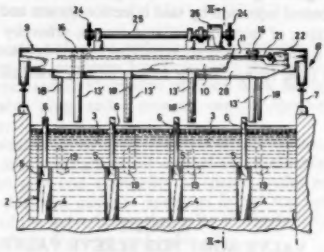
Willi Manthey, Duisburg, and Horst Deiwick, Krefeld-Gartenstadt, both of Germany, assignors to BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H., Duisburg, Germany

Filed July 6, 1976, Ser. No. 702,587

Claims priority, application Germany, July 7, 1975, 2530237

Int. Cl.[2] B08B *3/04*

U.S. Cl. 134—76 **11 Claims**



1. An apparatus for cooling hot slabs in a soaking pit divided into a plurality of slab-receiving compartments formed by rows of stakes rising from parallel beams within the pit, comprising:

rail means alongside said pit paralleling said beams;

a transporter riding on said rail means, said transporter including a traverse spanning said pit;

first and second guide means fixedly depending from said traverse at locations separated in the transport direction by a distance substantially equaling twice the spacing of said stakes;

vertically movable gripper means on said traverse disposed between said first and second guide means and defining therewith a first and a second carrying cage alignable with a pair of adjoining compartments; and

hoist means on said transporter for reciprocating said gripper means between an elevated transport position above said stakes and an immersion position at the level of said beams, said gripper means being provided with retractable slab-supporting means alternately extendable across the bottoms of said cages for depositing a hot slab from said first cage on two of said beams in one compartment and then lifting a cooled slab into said second cage from the other compartment of said pair of adjoining compartments.

4,036,244

VERTICAL ARCH SHELTER

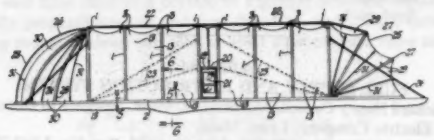
Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Pleasant Ridge, Mich.

Continuation-in-part of Ser. No. 339,333, May 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 93,293, Nov. 27, 1970, abandoned. This application June 12, 1975, Ser. No. 576,101

Int. Cl.[2] A45F *1/16*; E04B *1/32*

U.S. Cl. 135—4 R **15 Claims**

1. A vaulted membrane shelter comprising at least two substantially vertical arches with curved bights mounted on a base face to face but spaced apart with means to fix said arches in space to form a vaulted framework; a tensioned flexible membrane extending between and being operatively attached to said arches by means that permits membrane tensioning movement downward along arch circumference; said membrane being fabricated to form an inward concave curvature



between the bights of said arches, having a maximum depression of at least 5% of the distance between said arches, producing double curvature in said membrane; and means for maintaining tension in said membrane acting between the lower portion of said membrane and said base to diminish membrane vibration and increase rigidity of said shelter.

4,036,245

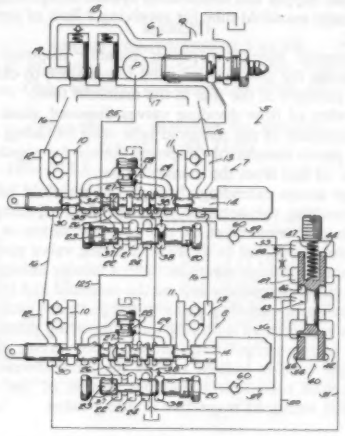
PRESSURE COMPENSATED HYDRAULIC CONTROL VALVE

Francis Henry Tennis, Oconomowoc, Wis., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 29, 1975, Ser. No. 645,203

Int. Cl.[2] F15B *13/08*

U.S. Cl. 137—117 **15 Claims**



11. In combination with a hydraulic control valve:

A. a pressure compensating valve device having a supply port for high pressure supply fluid, a use port through which such supply fluid can issue for flow to the control valve, an excess fluid port to which fluid from the supply port can flow in bypass relation to the use port, and a valve member by which part of the high pressure fluid entering the supply port can be diverted to the use port and the remainder can be diverted to said excess fluid port, in bypass relation to the use port, in quantities such as to tend to maintain a substantially constant pressure drop across said control valve;

B. an excess fluid flow control mechanism having an inlet connected with said excess fluid port, an outlet for connection with a reservoir, and fluid pressure responsive valve means to control flow of fluid from the inlet to the outlet;

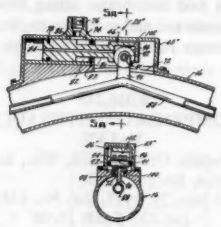
C. and means to render said valve means responsive to variations in the pressure differential between supply fluid and fluid at said excess fluid port, to thereby effect movement of said valve means in a direction to restrict communication between the inlet and outlet in consequence of rise in the pressure of supply fluid, and to effect movement of said valve means in the non-restricting direction in consequence of rise in the pressure of fluid at the excess fluid port.

4,036,246

FUEL SUPPLY AND DISTRIBUTION SYSTEM

Richard Henry Cornell, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Division of Ser. No. 487,888, July 12, 1974, Pat. No. 3,949,775.
This application Oct. 31, 1975, Ser. No. 627,727
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—118 **4 Claims**



1. A fuel supply and distribution system comprising:
an annular manifold tube for receiving a flow of pressurized fuel,
an actuator having a piston slidably disposed therein wherein the piston is actuated in response to changes in the pressure of the fuel in the manifold tube,
a plurality of flow dividing valves disposed about the circumference of the manifold tube each including a metering piston translatably disposed therein for regulating the flow of fuel from the manifold tube,
linkage means extending through the manifold tube interconnecting the actuator with the flow dividing valves such that movement of the actuator piston is simultaneously imparted to the flow dividing valve pistons, and
wherein the linkage means includes a tubular linkage extending circumferentially around the manifold and including a plurality of radially extending flange means each in rotatable engagement with respective metering pistons within the pressure regulating valves for converting movement of the tubular linkage around the circumference of the manifold tube to translational motion of the metering piston within its respective dividing valve.

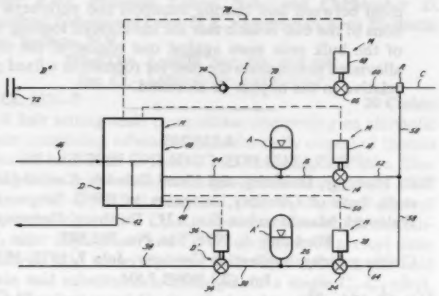
4,036,247

MULTI-PRESSURE, SINGLE LINE SUPPLY SYSTEM

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Filed Mar. 15, 1976, Ser. No. 667,175
Int. Cl.[2] E21B *43/01*
U.S. Cl. 137—236 **14 Claims**

1. A system for conveying fluid from a single subsea supply conduit to provide a fluid supply for both subsea well valve control apparatus and fluid injection apparatus, comprising:
fluid receiving means for receiving fluid under pressure from a single subsea supply conduit;
injection means operably connected to said fluid receiving means for injecting fluid from said fluid receiving means into a subsea well flowline;
accumulator means for supplying fluid to a subsea well valve control apparatus;
said accumulator means being in interruptible fluid communication with said fluid receiving means for being charged with fluid from said fluid receiving means; and
regulating means operably connected to said fluid receiving means, said injection means, and said accumulator means



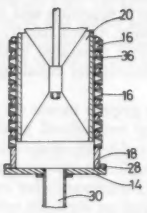
for regulating fluid flow from said fluid receiving means to control injection by said injection means and to control charging of said accumulator means, whereby said injection means and said accumulator means are both supplied with fluid from a single subsea supply conduit.

4,036,248

VALVE BODY FOR SLEEVE VALVE

Ikuo Yoshimori; Teruaki Nanao, and Toshio Sugino, all of Hirakata, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Feb. 13, 1976, Ser. No. 658,111
Claims priority, application Japan, Feb. 14, 1975, 50-20983
Int. Cl.[2] F16K *3/26*
U.S. Cl. 137—271 **6 Claims**

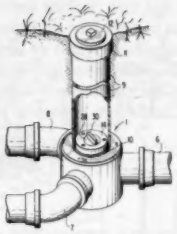


1. A valve body for a sleeve valve including the valve body having a peripheral wall formed with a multiplicity of discharge ports extending therethrough, a lower end provided with a bottom cover and an upper end to be secured to an upper wall of a reducing chamber, and a valve cylinder gate having open upper and lower ends and slidably fitted in the valve body in contact with the inner surface of the body, the valve cylinder gate being coupled to means operable from outside for upwardly or downwardly driving the gate to control the number of the discharge ports maintaining the interior of the valve body in communication with the outside thereof and to thereby regulate the flow of water, the valve body being formed with straight bores extending through the peripheral wall and having a uniform inner diameter, each of the straight bores fixedly fittingly receiving thereing a nozzle member including a straight cylindrical portion of a uniform outer diameter, the cylindrical portion having an outwardly tapered opening axially extending therethrough to constitute each of the discharge ports.

4,036,249
DIVERTER VALVE

Carlos V. Perry, Sr., 8805 Early St.; Carlos V. Perry, Jr., 9304 Stuart Ave., and Christopher G. Perry, 7452 Carlton Lane, all of Manassas, Va. 22110

Filed Nov. 29, 1976, Ser. No. 745,763
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—367 5 Claims



1. A diverter valve for underground installations operating at relatively low pressures for controlling the flow of effluent from a septic tank to a plurality of leach beds, having a valve body, a valve plug, and a retainer cap for the valve plug, comprising;

a thick-walled valve body of cast urethane defining a vertically disposed cylindrical central valve chamber having an inlet port and a plurality of spaced outlet ports, centrally disposed circular openings in the top and bottom walls of the valve body, the walls of which provide bearing surfaces for a tapered valve plug,

integrally cast downwardly tapered and uniformly spaced heavy ribs extending from the top to the bottom walls of the valve body dividing the central chamber into a plurality of substantially uniform smaller chambers communicating directly with the central chamber,

a valve plug comprising a unitary urethane casting having circular top and bottom sections rotatively mounted for sealing contact with the upper and lower bearing surfaces of the valve body, the valve body having a cut-away center section providing a passageway for alternately connecting the inlet port with one of the outlet ports, the remaining center portion of the valve plug being in slidable and sealing contact with at least two of the ribs to close at least one of the outlets while one outlet remains open, the valve plug having an integrally cast shaft at the upper end thereof, said shaft extending through the upper central opening in the top of the valve body and through an opening in the retainer cap, the upper end of the shaft having an upwardly extending projection adapted to receive a slotted tool to actuate the plug from ground level, and

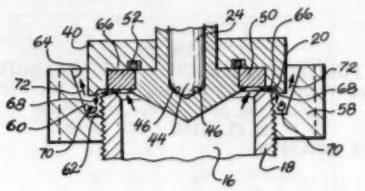
a circular groove in the top surface of the valve body adapted to receive a section of pipe, closed with a cap provided with a screw-threaded plug to afford access to the valve plug for operating the same.

4,036,250
BLOW-DOWN SAFETY VALVE

James W. Dashner, Charlotte, N.C., assignor to Consolidated Valve Industries, Inc., Matthews, N.C.

Filed Feb. 4, 1976, Ser. No. 655,068
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—476 11 Claims

1. A blow-down safety valve for use with elevated temperature fluid systems and the like to open when the pressure in said fluid system reaches a predetermined maximum level, said valve including a casing formed with an inlet conduit presenting a generally annular valve seat, a valve member selectively movable between a position seated on said valve seat, and an open positon spaced therefrom, said valve member including a generally flat seating portion for selective abutment with said annular valve seat and a fluid deflecting portion depending generally perpendicularly from said flat seating portion at a location beyond the peripheral extend of said valve seat whereby when said valve member initially permits gas to bleed at said valve seat fluid will flow along a first direction extending generally parallel to said valve seat and then be deflected by said fluid deflecting portion to a second direction substantially perpendicular to said first direction, and a blow-down ring mounted about said inlet conduit adjacent said valve seat

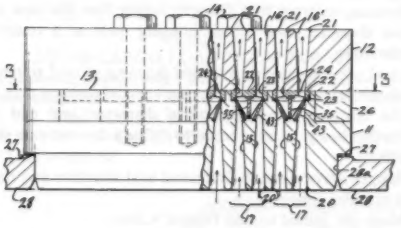


thereof, said blow-down ring forming an annular cavity including a bottom wall in said blow-down ring located directly beneath said fluid deflecting portion of said valve member and including a side wall extending from said bottom wall generally toward and beyond said fluid deflecting portion in spaced relation thereto whereby fluid flowing in said second direction will collect in said cavity and be directed therefrom by said side wall in a third direction extending generally opposite to said second direction.

4,036,251
FLUID COMPRESSOR VALVE

William F. Hartwick, and Charles H. Melcher, both of Mount Vernon, Ohio, assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 10, 1976, Ser. No. 684,625
Int. Cl.[2] F16K *15/02*
U.S. Cl. 137—512.1 9 Claims



1. An improved one-way fluid valve construction comprising a valve housing including a valve inlet block and a valve outlet block having generally planar abuttin inner surfaces, means attaching said valve inlet block and said valve outlet block together with said inner surfaces abutting, a valve stop insert, opening means between said valve inlet block and said valve outlet block retaining said valve stop insert, said valve stop insert having two curved surface areas facing said valve inlet block, a pair of spaced ports each extending through said valve inlet block, said valve stop insert and said valve outlet block, first and second rigid valve plates, means supporting each of said valve plates in said valve inlet block between said ports for pivoting between first and second positions, said first valve plate closing one of said ports when in said first position and opening said one port when pivoted to said second position and said second valve plate closing the other of said ports when in said first position and opening said other ports when pivoted to said second position, said valve plates each having

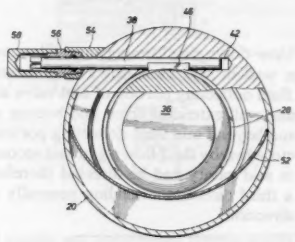
an edge which sweeps across a different one of said curved surface areas of said valve stop insert when pivoted, and spring means extending between said valve plates for simultaneously biasing both of said valve plates away from each other towards said first positions whereby said valve plates inhibit fluid flow in one direction through said ports.

4,036,252

FULL BORE PIPELINE VALVE APPARATUS

Thomas Wheatley, 3717 Pinemont, Houston, Tex. 77018

Filed Aug. 18, 1975, Ser. No. 605,231
Int. Cl.² F16K *15/03, 15/18*
U.S. Cl. 137—527.8 **3 Claims**



1. A full-opening check valve adapted for coupling into a pipeline of a specified upstream and downstream sizes which are equal to define a valve which will pass a pipeline pig of sizes up to a pig making full circle contact with the upstream and downstream pipes which check valve comprises

a funnel shaped housing having one end sized to be welded to a downstream pipe and which one end includes an axial opening equal to the pipe in internal diameter and which housing enlarges to a diameter larger than the pipe internal diameter, and which housing ends at a transverse shoulder;

an end plate welded across said housing at said transverse shoulder, said end plate having an axial passage matching the upstream pipeline internal diameter, said end plate further being counter bored to define a downstream shoulder;

a flapper valve sized to fit against said shoulder and having a circular shape;

a hinge pin joined to said flapper valve;

a hinge pin passage means in said end plate perpendicular to the path of flow through said housing, said passage means being spaced from said shoulder to pivotly rest said flapper valve against said shoulder in a fully closed position closing said axial passage to reverse flow;

a curved guide plate in said housing downstream from said end plate positioned to bottom support a pig passing through said housing and which plate slopes toward the end opening in said housing and which plate further extends across said housing;

an appendage to said end plate having a bore aligned with the hinge pin passage and disposed for receiving the hinge pin therein; said bore having

an internally threaded counterbore for receiving the externally threaded end of a sleeve,

a seal means for preventing leakage around said hinge pin; and

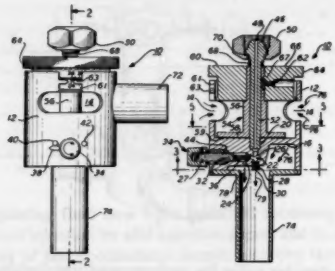
the other end of said sleeve being threadedly connected to a cap nut for protecting the end of said hinge pin.

4,036,253

GAS DILUTION DEVICE

Frank Joseph Fegan, West Orange, and William Harold Smith, Rahway, both of N.J., assignors to Peace Medical, West Orange, N.J.

Filed Nov. 12, 1975, Ser. No. 631,220
Int. Cl.² F16K *19/00*
U.S. Cl. 137—556 **12 Claims**



1. A gas dilution device comprising:

a first gas receiving nozzle,

settable orifice means in fluid communication with said nozzle for forming a plurality of selected physically spaced streams of said first gas at a plurality of selected given velocities,

a gas mixing and delivery chamber,

gas receiving port means including settable gas restriction means in fluid communication with said chamber for selectively restriction the flow of a second gas drawn into said chamber through said port by the flow of said first gas, said gas restriction means including means settable anywhere within a first given range arranged to provide in cooperation with the setting of said orifice means a first gas dilution ratio settable anywhere within a second given range,

said orifice means being disposed in fluid communication with and arranged to direct said streams into said chamber in a manner to draw said second gas into said chamber through said port, and

means coupled to said orifice means for selectively setting said orifice means to provide a selected velocity of said first gas into said chamber, the selected velocity corresponding to the setting of said gas restriction means whereby the first gas flowing into said chamber is mixed with and diluted with the second gas at a selected dilution ratio corresponding to a given first gas velocity and corresponding gas restriction magnitude within said first range.

4,036,254

CONTAINER THAT CAN BE DISPLACED BY ROTARY FORCE

Francisco Alcalde Pecero, Santa Clara No. 40, Seville, Spain

Filed Aug. 27, 1975, Ser. No. 608,108
Claims priority, application Spain, Jan. 29, 1975, 434253
Int. Cl.² E03B *11/00*
U.S. Cl. 137—581 **9 Claims**

1. A longitudinally extending flexible container for a voluble material adapted to impart to the material contained therein a

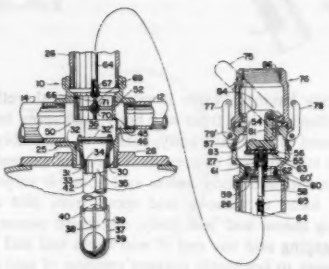
rotary motion along the longitudinal axis of the container as said container is moved along an abutting surface; said container being defined by a continuous flexible outer skin adapted to conform to the surface along which the container is moved, said skin having the shape of an elongated torus with its shorter opposite sides assuming a convex annular configuration of semi-circular cross-section surrounding a hole formed along an axis substantially parallel to the longer sides of the skin when the contents are rotated about said axis as the container is moved along the abutting surface, said axis being defined by means interposed in said hole and held in position therein by pressure exerted thereon by the voluble material to cause said skin to be successively turned inside itself and displaced along the abutting surface as a force is applied to said interposed means in the direction of desired movement of the container.

4,036,255

VAPOR RECOVERY ADAPTER

Fred A. Wilson, Florence, Ky., assignor to Dover Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,708
Int. Cl.[2] F16K *11/14, 1/14*
U.S. Cl. 137—587 **9 Claims**



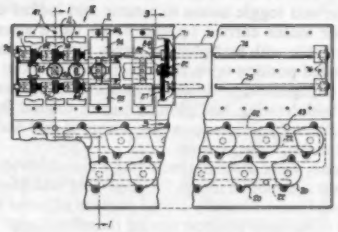
1. A vapor recovery adapter for use with a plurality of tanks having vapor therein to be removed including a housing mounted on one of the tanks and having a first inlet port communicating with the one tank to receive vapor therefrom, said housing having a second inlet port communicating with at least one other tank to receive vapor therefrom, said housing having a first outlet port in communication with a vent to atmosphere, said housing having a chamber with which said first and second inlet ports and said first outlet port communicate whereby vapor may flow from the tanks through said first and second inlet ports to said first outlet port, said housing having a second outlet port disposed above said first outlet port, and housing having a passage therein, one end of said passage communciating with said chamber and the other end of said passage communicating with said second outlet port, and valve means movable in said housing between a first position in which said valve means blocks said first outlet port and opens said second outlet port without blocking communication of said first inlet port with said chamber and communication of said second inlet port with said chamber and a second position in which said valve means blocks said second outlet port and opens said first outlet port without blocking communication of said first inlet port with said chamber and communication of said second inlet port with said chamber, said valve means being moved to its first position when at least one of the connected tanks is being supplied liquid to expell vapors from any of the connected tanks through said second outlet port, said valve means being moved to its second position when none of the connected tanks is being supplied liquid.

4,036,256

ADJUSTABLE VALVE ASSEMBLY

Arthur T. Bublitz, Saline, Mich., and Eugene F. Holben, Haddonfield, N.J., assignors to Reliance Electric Company, Pepper Pike, Ohio

Division of Ser. No. 602,245, Aug. 6, 1975, Pat. No. 3,982,726.
This application May 10, 1976, Ser. No. 684,860
Int. Cl.[2] F16K *31/04*
U.S. Cl. 137—595 **7 Claims**



1. A ganged valve assembly including a plurality of valve bodies;

each of said valve bodies including a valve seat and a valve member movable in a first plane along a valve axis in two directions relative to the respective valve seat to establish a variable orifice therewith,

a motor,

line shaft means connected to be driven by said motor and journalled for rotation about a second axis and transverse to said plurality of valve bodies in a second plane substantially normal to said first axis,

each of said valve bodies including first and secong drive trains from said line shaft means to the respective valve member,

first and second clutch means in each of said first and second drive trains, respectively,

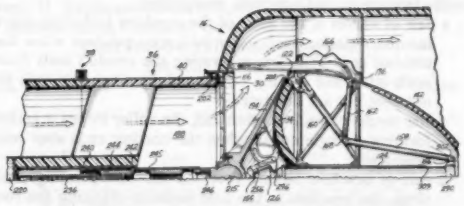
and actuator means connected to actuate each of said first and second clutch means.

4,036,257

LIQUID CARGO LOADING APPARATUS

Carl V. Hanson, Renton, and Philip C. Whitener, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 26, 1975, Ser. No. 562,264
Int. Cl.[2] F16L *29/00*
U.S. Cl. 137—614.06 **25 Claims**



1. In a coupling apparatus for loading and unloading liquid to and from a transport and including a valve assembly mounted on said transport and a liquid conducting hollow boom positionable with respect to said transport and having a valve assembly at its positionable end for mating engagement with said transport valve assembly, the combination therewith comprising:

movable valve closure means and toggle locking means therefor mounted in said transport valve assembly, said toggle locking means having a locked condition in which

said transport valve closure means is held in a locked, closed position and having an unlocked condition in which said transport valve closure means is unlocked and is free to move to a open valve position;

plunger means mounted in said transport valve assembly and connected to said toggle locking means and being movable from a normal unactuated position to an actuated position to cause said toggle means to assume its unlocked condition, and being movable from said actuated position back to its unactuated position to cause said transport valve closure means to assume its closed position and to cause said toggle means to assume said locked condition;

actuator means carried by said boom valve assembly and engagable with said plunger means for displacing it to its actuated position upon movement of said boom into mating engagement with said transport valve assembly and for withdrawing said plunger means toward its normal, unactuated position upon movement of said boom out of said mating engagement;

said boom valve assembly including a movable valve closure means and motive means for displacing said boom closure means from a normally closed position adjacent said boom end to an open position spaced therefrom; and

said boom valve closure means being engagable with said unlocked transport valve closure means duriing said mating engagement of said valve assemblies for forcibly impelling said transport valve closure means to its open position in unison with said boom valve closure being displaced to its open position.

4,036,258

HIGH SPEED SHUT OFF OF CONDUITS

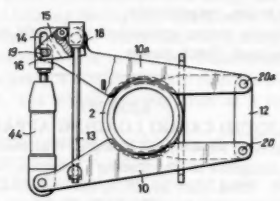
Hans Richard Wolters, Schwalmtal, and Heinz Keltjens, Hemmerden, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 7, 1976, Ser. No. 646,951

Claims priority, application Germany, Jan. 8, 1975, 2500896

Int. Cl.[2] F16L *37/28*

U.S. Cl. 137—614.04 **5 Claims**



1. High speed shut off and separation device for two normally interconnected conduits, comprising:

a pair of valves in the ends of the conduits including valve members biasing each other into open position when the conduit ends abut, but separating the conduit ends from each other and closing both conduits when the ends do not abut but are separated;

collar means on each conduit end, the collar means together forming a single collar when the conduit ends abut concentrically;

a pair of brackets having first and second operating positions, the brackets in the first position engaging the two collar means for holding the conduits together, the brackets when in the second position being disengaged from the collar means so that said valves close;

a pair of arm means respectively on said brackets and carrying said brackets; and

means including (a) at least one pneumatic or hydraulic drive for interconnecting one end each of said arm means with each other for moving the brackets from the first to the second position for shut-off and separation, further including (b) a tie rod pivoted on one of the arm means; (c) a latch on the other one of the arm means and cooperating with the tie rod for locking the arms and brackets in the first position; and (d) cam means on the latch operated in response to operation of said drive for unlatching the tie rod.

4,036,259

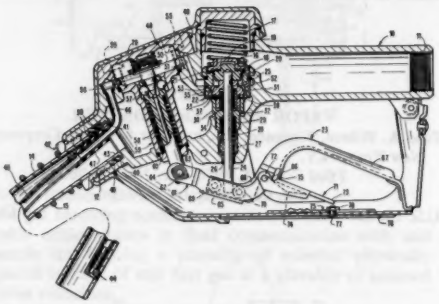
FLUID DISPENSING NOZZLE

Paul R. Wilder, and Chester W. Wood, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 439,302, Feb. 2, 1974, abandoned, which is a division of Ser. No. 244,844, April 17, 1972, Pat. No. 3,817,285. This application June 12, 1975, Ser. No. 586,192

Int. Cl.[2] B67D *5/37*

U.S. Cl. 137—801 **5 Claims**



1. A body having a valve to control flow therethrough, a spout to dispense fluid from said body, said spout having one end disposed within said body, means to releasably connect said spout to said body to prevent relative movement between said spout and said body unless said spout is subjected to a sufficient force to remove said spout from said releasably connecting means and said body, alignment means cooperatively engaging said one end of said spout and said body in a fixed manner to positively prevent rotation of said spout and maintain alignment of said spout relative to said body without preventing removal of said spout when said spout is subjected to the sufficient force to remove said spout from said releasably connecting means said body, and said alignment means including means to cooperate with said one end of said spout and said body to limit the movement of said spout into said body, said releasably connecting means being resilient so that forceable removal of said spout will not damage said connecting means.

4,036,260

GATE VALVE WITH EXPANDABLE AND CONTRACTABLE CLOSURE MEMBER

Albert Sidney Davis, 11822 S. Evelyn Circle, Houston, Tex. 77071; Robert William Davis, 4310 Goldfinch, Houston, Tex. 77035, and Joseph Paul Weber, Rte. 1, Box 589A, Alvin, Tex. 77511

Filed June 26, 1975, Ser. No. 590,686

Int. Cl.[2] F16K *3/18*

U.S. Cl. 138—94.3 **25 Claims**

1. A valve comprising:

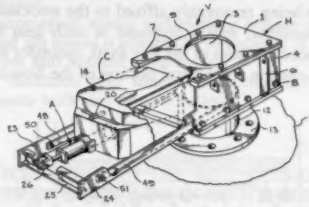
a housing having at least one opening therethrough around which is provided a seat;

closure means having a seat engaging surface thereon for blocking flow through said opening;

actuator means connected to said closure means for transversely moving said closure means relative to the flow path of said opening, between a first position, out of said flow path, and a second position, in said flow path;

biasing means carried by said housing biasing said closure means away from said seat during movement between said

first and second positions without engaging said seat engaging surface during said movement; and



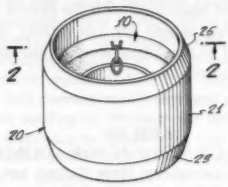
means for expanding said closure means when in said second position, in a direction parallel to said flow path for sealingly engaging said seat engaging surface with said seat means to provide a fluidtight seal of said opening.

4,036,261

THREAD PROTECTOR FOR OIL-WELL PIPE AND BLADDER INCORPORATED THEREIN

Ernest D. Hauk, Signal Hill; Thomas D. Hauk, and Kenneth J. Carstensen, both of Huntington Beach, all of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed July 29, 1975, Ser. No. 600,109
Int. Cl.[2] F16L *57/00*; B65D *59/06*
U.S. Cl. 138—96 T **38 Claims**



1. A fluid operated thread protector for the threaded end of a pipe section, which comprises:

a. housing means having a first portion sized to be mounted around the exterior of the threaded end of a pipe section, said housing means also having a second portion sized to be mounted within the interior of said threaded end,

b. bladder means having a first portion mounted within said first portion of said housing means and exterior to said threaded end,

said bladder means also having a second portion mounted around said portion of said housing means, being interposed between said threaded end and said second portion of said housing means,

c. means to create greatly increased fluid pressures within said housing means and thereby effect fluid shifting of at least part of said first portion of said bladder means radially inwardly into tight gripping relationship to the exterior of said threaded end, and also effect fluid shifting at at least part of said second portion of said bladder means radially outwardly into tight gripping relationship to the interior of said threaded end,

whereby said threaded end is tightly gripped in response to fluid forces and on both the exterior and interior thereof,

d. means to prevent said housing means from shifting off said bladder means,

whereby said housing means is prevented from shifting off said threaded end despite loads and shocks received by said housing means during movement of said pipe section, and

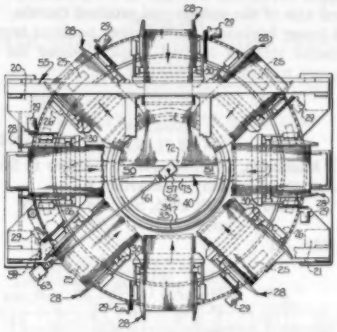
e. means to prevent unintentional loss of the fluid pressure maintaining in said shifted positions said first and second portions of said bladder means.

4,036,262

TRIAXIAL WEAVING MACHINE WITH WARP STRAND GUIDES

Burns Darsie, and Richard A. Schewe, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jan. 29, 1976, Ser. No. 653,490
Int. Cl.[2] D03D *41/00*
U.S. Cl. 139—11 **17 Claims**



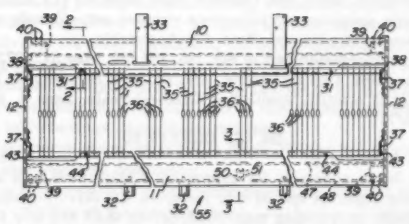
1. In a weaving machine for making triaxial fabrics and having a plurality of elongate heddles arranged in weftwise rows for guiding warp strands, means for shifting the warp strands weftwise during weaving, creel means for supplying warp strands for weaving and mounted for rotation in timed relation with weftwise shifting of the warp strands, and means for guiding warp strands passing from said creel means to said heddles along substantially constant length paths, the improvement wherein said warp strand guiding means comprises generally circular first guide means for engaging all the warp strands and having a diameter less than the weftwise length of said rows of heddles, yarn separator means for engaging warp strands intermediate said first guide means and said heddles and being mounted for movement in timed relation with weftwise shifting of the warp strands and rotation of said creel means, and second guide means adjacent to and cooperating with said yarn separator means for maintaining engagement of said warp strands with said yarn separator means.

4,036,263

HEDDLE FRAME

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed June 14, 1976, Ser. No. 696,127
Int. Cl.[2] D03C *9/06*
U.S. Cl. 139—91 **5 Claims**



1. In a heddle frame having top and bottom rails connected at their ends by struts,

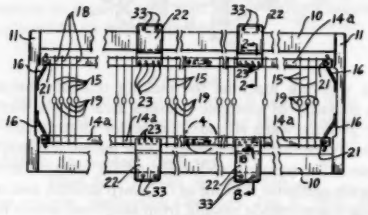
said bottom rail comprising
a rear plate having a continuous and uninterrupted bottom edge,
a front plate having a continuous and uninterrupted bottom edge,
an upper horrizontal wall connecting said front and rear plates,
a lower horizontal wall connecting said front and rear plates and spaced above the edges of said plates,
said plates and said walls providing a box like section,
a block member for push rod engagement in said section having its upper margin spaced downwardly from said upper horizontal wall and in the proximity of the neutral axis of the section and retained therein,
said lower horizontal wall having portions terminated in spaced relation to said block member for push rod access to said block member.

4,036,264

LOOM HARNESS

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed July 23, 1976, Ser. No. 708,119
Int. Cl.[2] D03C 9/06
U.S. Cl. 139—92 **8 Claims**



1. The combination with a heddle frame having top and bottom rails, and a plurality of heddles in said frame of
upper and lower heddle rods parallel to and in spaced relation to said rails for carrying said heddles,
each of said heddle rods comprising a plurality of aligned rod sections with opposite outer vertical continuous aligned faces,
certain of said rod sections having secured thereto a rail attachment member for engagement with one of said rails,
means for retaining meeting ends of aligned rod sections against horizontal and vertical displacement,
said means including inte engaging vertical face portions intermediate said vertical faces and extending inwardly from the ends of said rod sections, and
a member for holding said face portions in engagement.

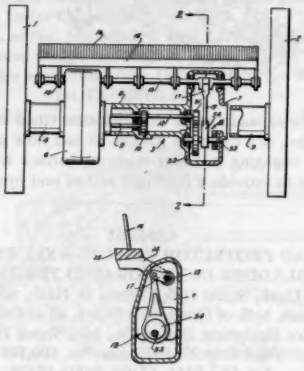
4,036,265

DEVICE FOR SUPPORTING THE SLAY DRIVE OF A LOOM

Jaromír Malásek, Ostrava; Vladimír Kuda, Blazkovice; Pavel Dvoracek, Brno, and Vladimír Horn, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 258,348, May 31, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,116
Claims priority, application Czechoslovakia, June 2, 1971, 4033/71
Int. Cl.[2] D03D 49/60
U.S. Cl. 139—190 **2 Claims**

1. In an apparatus for supporting a slay drive in a loom having a pair of spaced side members, the drive including a mutually cooperating main shaft, driven shaft and slay shaft, the apparatus comprising a self-supporting closed housing extending between the side members and receiving the main and driven shafts, the housing including a center part having a pair of gear boxes disposed on opposed outer ends thereof and a pair of end pieces individually extending between the respective gearboxes and the adjacent side members of the loom, each end piece being removably affixed to the associated gear box and side member, means disposed in each gear box for journalling spaced portions of the slay shaft, meansfor supporting the driven shaft in the central portion of the housing with



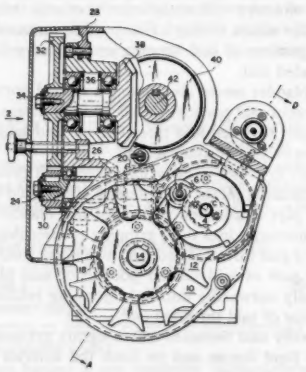
the ends of the driven shaft terminating in the respective gear boxes, means disposed in the housing for rotatably coupling the main and driven shafts, and motion-changing means disposed in each gear box and associated with the driven shaft and the slay shaft journalling means for converting the rotational movement imparted to the driven shaft by the main shaft into an oscillatory motion of the slay shaft.

4,036,266

TAKE-UP MOTION FOR LOOMS

Siegbert Gsell, Neuravensburg; Hans Geiger, and Hans-Jurgen Maierhofer, both of Lindau, all of Germany, assignors to Lindauer Dornier Gesellschaft mbH., Germany

Filed Apr. 1, 1976, Ser. No. 672,736
Claims priority, application Germany, Apr. 17, 1975, 2516888
Int. Cl.[2] D03D 49/20
U.S. Cl. 139—304 **3 Claims**



1. In a cloth take-up motion for looms with gradual taking-up of the cloth in which a take-up roller is adapted to be driven by drive shaft means and gear system means, and wherein the drive shaft executes one revolution with each weft,
the improvement which comprises crank means and pin means on said drive shaft means,

means axially displaceably mounting said pin means in said crank means,

Maltese cross means in which said pin means is adapted to engage,

electromagnet means and shifting linkage means whereby said pin means is adapted to be engaged in and disengaged from said Maltese cross means,

and reduction gear means connecting said Maltese cross means with said take-up roller.

4,036,267

DEVICE TO DETECT THE BELT TENSION OF WEFT INSERTING MEMBERS IN SHUTTLELESS LOOMS

Luciano Santi, Florence, Italy, assignor to Officine Galileo Meccanotessile S.p.A., Florence, Italy

Filed Aug. 5, 1976, Ser. No. 712,063

Claims priority, application Italy, Aug. 7, 1975, 9509/75

Int. Cl.² D03D *51/18*

U.S. Cl. 139—336 **7 Claims**

1. A device to detect the tension uniformity of a belt in a weft inserting member of a shuttleless loom of the type having a belt anchored at its ends to fixed contiguous points, guide rollers for said belt, and a movable carriage supporting said rollers and movable with reciprocating motion to control a gripper for insertion of weft threads, said device comprising a cylindrical anchoring body on which one belt end is partly wound, an elastic means mounted on said body and disposed between the belt end and said body, said elastic means having resiliency and tending to displace the belt section wound on said body and serving to displace the belt section in the event of a reduction in the belt tension, and means for detecting such displacement of the belt section.

4,036,268

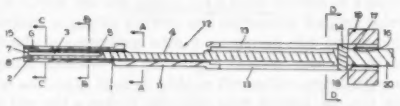
WIRE WRAPPING APPARATUS

Derek Ward, 11 Tui Vale Road, Auckland, New Zealand

Filed Mar. 30, 1976, Ser. No. 671,823

Int. Cl.² B21F *15/00*

U.S. Cl. 140—124 **15 Claims**



1. A tool for stripping an insulated wire and/or wrapping the wire around a terminal tag, said tool comprising a sleeve member and abit member adapted to slide axially within said sleeve member, said bit member having a longitudinal aperture at the free or operative end thereof adapted to receive said terminal tag, a recessed portion in the side of said bit member intermediate of the length thereof, a groove-channel means in the side of said bit member between said free end and said recesses portion, and a first insulating shearing means substantially at the junction of said groove-channel means with said recessed portion, said sleeve member incorporating a second insulating shearing means within said sleeve member axially located a predetermined distance from the free end of said sleeve member so that in use, upon said bit member being axially advanced, so that at least a part of said recessed portion protrudes from the free end of said sleeve member an insulated wire is inserted between the said sleeve and said bit and said bit withdrawn axially into said sleeve causing said first and said second insulation shearing means to coact with one another to rupture the insulation on said wire, said axial movement being continued to at least partially strip a predetermined length of insulation from said wire, said longitudinal aperture in said bit then being engageable with said terminal tag and said bit rotated thereabout causing said wire to wrap about said tag, where, by virtue of said second insulation shearing means being located a predetermined distance from the end of said sleeve member, a predetermined length of the wire-wrapped around the base of said tag retains the insulation covering.

4,036,269

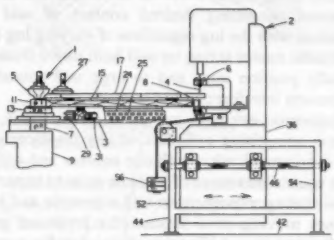
AUTOMATIC SHAPING DEVICE WITH A PRE-CUTTING ASSEMBLY

Arthur J. Rhodes, 2601 Benoch Ave., Louisville, Ky. 40216

Filed Sept. 4, 1975, Ser. No. 610,417

Int. Cl.² B27C *9/00*, *5/02*; B26D *1/46*

U.S. Cl. 144—1 D **5 Claims**



1. In an automatic shaping device having a table, a power-driven shaping tool mounted to project above said table, a power-driven workpiece carrying member movably mounted to said table, said workpiece carrying member including template carrying means, the improvement comprising:

a frame having a cutting assembly means movably mounted thereto, said cutting assembly means including a power-driven band saw with a housing therefor;

forcing means cooperating with said cutting assembly and attached thereto for forcing said band saw into said workpiece; and,

a guide assembly attached to said housing, said guide assembly engageable with a template in conformity with a pattern defined by the outer periphery of said template.

4,036,270

LOG PEELING MACHINE

Kenneth G. Bright, Camas Valley, Oreg., assignor to Robert L. Westbrook and Henry Westbrook, III, both of Smith River, Calif., part interest to each

Continuation-in-part of Ser. No. 529,814, Dec. 5, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,628

Int. Cl.² B27L *1/00*

U.S. Cl. 144—208 E **33 Claims**

1. In a log peeling machine having a fixed axis peeler drum assembly supported on an elongate machine frame for the removal of the outer log surface, the improvement comprising a log conveying apparatus disposed intermediate upright members of the machine frame for linear passage of a log along an axis coincident with the fixed axis of said peeler drum assembly, said conveyor apparatus comprising,

a conveyor assembly disposed below the log being peeled, said assembly comprising,

a horizontal conveyor frame adapted for vertical travel relative to the machine frame,

a continuous log conveyor having upper and lower runs entrained about said frame for supported travel of the log along the conveyor frame,

a motor on said frame powering said log conveyor,

hydraulic means acting on said frame to move same toward and away from the projected axis of the peeler drum assembly,

a log hold down assembly supported by the peeling machine and disposed above the log path, said hold down assembly comprising,

a hold down frame,

rotatable means mounted in a spaced apart manner on said frame and adapted to bear in a spaced apart manner upon a log being peeled confining same against the conveyor assembly,

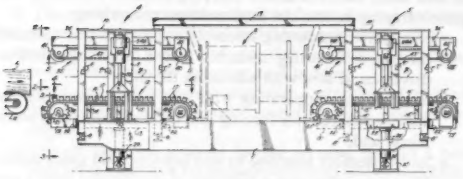
a motor carried by said frame in driving connection with said rotatable means,

guide means slidably entrained on said upright members of the machine frame for travel toward and away from the projected axis of the peeler drum assembly,

pivot means interconnecting the hold down frame and said guide means permitting limited rotational movement of the frame about the horizontal axis of said pivot means permitting desired contact of said rotatable means with the log regardless of varying log diameters,

hydraulic means acting on said hold down frame to vertically position same and to urge said rotatable means thereon into forceful log contact, and

said conveyor assembly and hold down frame hydraulic means comprising cylinders of like displacement and in series communication with one another and with an operator controlled source of pressure so as to impart synchronous closing movement to said conveyor and hold down frames moving same toward the projected axis of the peeler drum assembly to confine a log for passage along said axis through said peeler drum assembly in a precise manner.



23. In a log peeling machine having infeed and outfeed conveyor apparatuses disposed on a machine frame for the transfer of a log in an axial manner, the improvement comprising a peeler drum assembly disposed on said machine frame intermediate said apparatuses, said peeler drum assembly comprising,

a drum structure rotatably supported by the machine frame and adapted for powered rotation in one direction about a horizontal axis constituting the peeler drum assembly axis,

motorized cutter head assemblies swingably mounted on said drum structure for movement toward the drum structure axis,

means carried by said drum structure urging said cutter head assemblies toward a log moving in a coaxial manner through the drum structure,

a hydraulic tank structure rotatable with said drum structure,

counterrotating means adapted for powered rotation opposite to said one direction of drum rotation, and

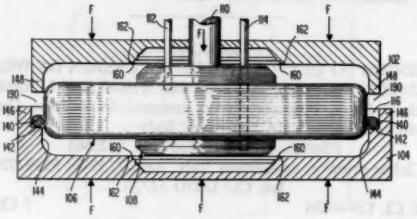
drum mounted pump components in driven connection with said counterrotating means providing the cutter head assemblies with a power source.

4,036,271

SEAMLESS RETREAD ENVELOPE

Fredrick Joseph Presti, 164 Shady Brook Circle, Warrington, Pa. 18976

Filed Sept. 10, 1975, Ser. No. 612,187
Int. Cl.[2] B29H *17/36*
U.S. Cl. 150—54 B **1 Claim**



1. An article of manufacture for encasing the exterior surfaces of a tire having a cured tread adhered thereto by an uncured bonding layer during the curing of said tire, to form a retreaded tire, said article comprising a seamless compression-formed envelope for encasing the tread, bonding layer and side walls of said tire to thereby retain said tread against said tire and to prevent air from contacting said bonding layer, during said curing process, said envelope being compression molded to comprise two parallel, co-cylindrical substantially circular peripheral edges connected and spanned by a single elastomeric web extending radially outwardly from said edges, said elastomeric web having a U-shaped radial cross-section, said web comprising side wall and base wall portions, said side wall portions being generally disposed within parallel spaced apart planes and extending for a distance at least sufficient to encase at least the side walls of said tire to be encased, and said base wall portion being disposed generally within a cylindrical surface which is concentric to and of a radius which is greater than the radius of said peripheral edges by a distance at least as great as the side wall to be encased, said side wall portions portion and base wall portion being joined to each other by curved connecting portions.

4,036,272

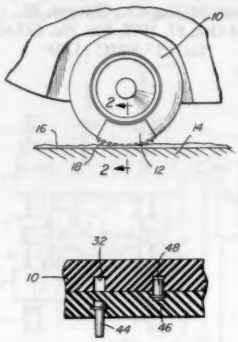
SURE GRIP WINTER TIRE TRACTION DEVICE

Poy Lee, 52 Tennyson St., Somerville, Mass. 02145

Continuation-in-part of Ser. No. 547,624, Feb. 6, 1975, Pat. No. 3,937,262. This application Nov. 24, 1975, Ser. No. 634,514
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.[2] B60C *27/00, 11/14*
U.S. Cl. 152—210 **2 Claims**

1. A device for attachment to a vehicle tire to improve traction of the tire with a surface upon which the tire rests, said device comprising an arcuate segment of a studded tire which is of a size that permits the segment to be attached to the vehicle tire and has a plurality of studs embedded in the segment with one end of the studs extending radially outwardly of

the segment, a second plurality of studs also embedded in the segment and means for holding the studs of the second plurality of studs in the segment with one end of the studs extending radially inwardly of the inner surface of the segment.

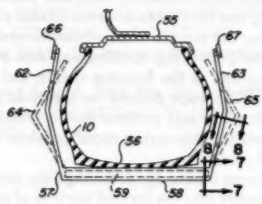


4,036,273

TRACTION AUGMENTING ROAD GRIPS

Kenneth E. Kemper, 2905 Cable Road, Anaconda, Mont. 59711

Filed June 16, 1975, Ser. No. 587,271
Int. Cl.[2] B60C *27/00, 27/10*
U.S. Cl. 152—225 R **9 Claims**



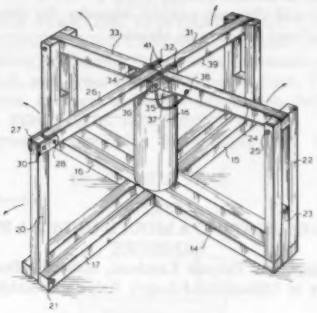
1. A traction augmenting rib removably attachable to a vehicle tire or the like which has a cross-section of a generally flat surface engaging portion and outwardly bulging sidewalls attachably cooperating with a mounting rim comprising an elongated member of semi-rigid flexible material having a central section at least as wide as the surface engaging portion of the tire and a pair of side arms each having one end thereof attached to a respective end of said central section so as to form a generally U-shaped configuration, at least one rigid cross bar embedded within said central section so as to extend throughout the length of said central section, said central section having a generally smooth inner surface for flush interfacing with the surface engaging portion of the tire, said arms being arranged in an outwardly directed spring bow relative to the sidewalls of the tire when the inner surface of said central section is placed against the surface engaging portion of the tire, and means for applying forces to the other ends of said side arms in a direction radially inward relative to the axis of the tire and with sufficient magnitude to at least partially straighten said side arms, each said side arm having sufficient length for responding to said radially inward force so that the said other end thereof is positioned at least in proximity to the edge of the mounting rim, said side arms each being adapted to flexingly follow changes in contour of the tire during movement of the vehicle.

4,036,274

SAFETY CAGE FOR TIRE INFLATION

Aubrey A. Peel, Sr., Rte. 2, 1505 Nemeth St., Auburndale, Fla. 33823

Filed July 6, 1976, Ser. No. 702,719
Int. Cl.[2] B60C *25/00*
U.S. Cl. 157—1 **9 Claims**



1. Safety cage for placing a pneumatic tire during inflation comprising in combination:

a base frame;

a center post member attached to said base frame and protruding therefrom, said center post member having a locking bracket fixedly attached thereto;

side frame members attached to said base frame in a spaced relationship to said center post member;

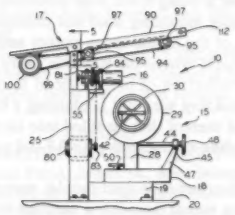
top frame members attached to said side frame members and movable toward said center post member in one position and movable to a second position to allow a pneumatic tire around said center post member, each said top frame member having a locking member mounted thereon for locking to said locking bracket fixedly attached to said center post member.

4,036,275

TIRE STRIPPING APPARATUS

Charles Earl Branick, 1601 S. 9th St., Fargo, N. Dak. 58102

Continuation of Ser. No. 460,356, April 12, 1974, abandoned. This application June 20, 1975, Ser. No. 588,725
Int. Cl.[2] B29H *21/08*; B24B *21/02*
U.S. Cl. 157—13 **18 Claims**



11. In combination, an apparatus for stripping tread from tires comprising,

tire support means including drive means for rotating a tire mounted thereon about its normal axis of rotation,

cutting means for engaging a tire mounted on said tire support means for removing excess material from said tire,

tire abrading means, second support means disposed adjacent said tire support means and supporting said tire abrading means for movement into engagement with said tire, said tire abrading means includes an elongate support,

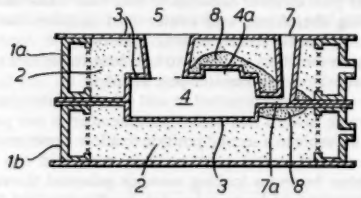
coupling means for pivotally mounting said elongate support on said second support means adjacent said tire support means, belt sanding means mounted on said support means for pivotal movement therewith into selective tangential engagement with a tire supported on said tire support means, said coupling means also mounting said elongate support on said second support means for movement in an arcuate path which is generally normal to the axis of said elongate support whereby the shoulder portions of said tire may be abraded.

4,036,276

METHOD OF SHAPING A MOULD UNDER A REDUCED PRESSURE

Kyozo Yahagi, and Takashi Yasukuni, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1975, Ser. No. 617,164
Claims priority, application Japan, Sept. 30, 1974, 49-111635
Int. Cl.[2] B22C *1/16*
U.S. Cl. 164—7 **2 Claims**



1. In a method for producing a cavity mould, wherein:

a flask is filled with moulding sand not containing a binder and covered with an airtight film which constitutes a shield having an ingate and sprue runner; a pattern is placed on the shield and the shield is formed thereabout; negative pressure is drawn on the moulding sand through the flask to maintain a mould cavity in the shape of the pattern and the pattern is removed;

the improvement wherein:

when the flask is being filled with moulding sand, instead of entirely using moulding sand not containing a binder, in the region of the mould sprue runner and elsewhere adjacent the shield where the shield is likely to be destroyed during introduction of molten metal into the mould cavity, the moulding sand not containing a binder is omitted, and instead thereof there is filled into those regions of the flask moulding sand mixed with 0.5–3.0 percent binder, by weight.

2. A reduced-pressure shaped mould, comprising:

a flask having means drawing a vacuum therethrough;

said flask containing a filling of moulding sand;

said flask also having an airtight film covering, including a portion lining surface means of the moulding sand and defining a mould cavity with an ingate and sprue runner communicating with the mould cavity;

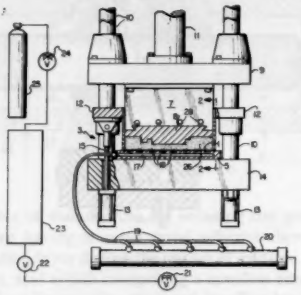
said moulding sand not containing binder, except by said surface means about the sprue runner and by said surface means elsewhere where the shield is likely to be destroyed during introduction of molten metal into the mould cavity, the moulding sand of these exceptions being mixed with 0.5–3.0 weight percent binder.

4,036,277

HIGH SPEED METHOD AND APPARATUS FOR PRODUCING FOUNDRY MOLDS

Kent Woonton, Kitchner, Canada; Jeffrey R. Short, III, Lincolnshire, Ill., and Kenneth N. Roach, Willowdale, Canada, assignors to J. R. Short Milling Co., Chicago, Ill.

Filed Oct. 17, 1975, Ser. No. 623,411
Int. Cl.[2] B22C *15/08*
U.S. Cl. 164—16 **10 Claims**



1. A method for producing foundry mold parts, comprising

preparing a foundry sand mix comprising binder material which can be cured by a curing gas to render the mold part rigid;

depositing the sand mix upon an endless foraminous conveying member to form on the conveying member a bed of sand mix of predetermined depth;

moving the conveying member to present a portion of the bed of sand mix at a forming station at a time when the sand mix is characterized by adequate plastic flowability for forming and the binder material retains a curing potential adequate for rigidification of the formed mold part;

supporting the conveying member and said portion of the bed of sand mix at the forming station and forming said portion into the shape desired for the mold part by pressing a pattern into said portion with a pressure of 10–150 p.s.i. toward the conveying member while laterally confining said portion;

passing a gaseous curing agent through the foraminous conveying member into the formed portion of sand mix while the pattern is in engagement therewith and said portion is still laterally confined and thereby curing the shaped mold part to at least such an extent that the mold part can be moved and handled without breakage or significant deformation;

withdrawing the pattern from the shaped mold part so cured; and

removing the mold part from the forming station by advancing the conveying member beyond the forming station.

4,036,278

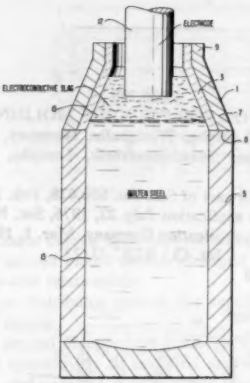
PROCESS FOR THE PRODUCTION OF LARGE STEEL INGOTS

Aldo Ramacciotti, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Nov. 11, 1975, Ser. No. 630,765
Claims priority, application Italy, Nov. 11, 1974, 53975/74
Int. Cl.[2] B22D *27/02, 27/06*
U.S. Cl. 164—52 **8 Claims**

1. In a process for the production of a large steel ingot free from defects due to shrinkage cavities and with reduced segregation and low absorbed hydrogen content, comprising teeming a quantity of liquid steel into an ingot mold, establishing a layer of electrically conductivity liquid slag over said steel, immersing an electrode in said slag, and passing an electric current through said electrode and slag and steel to keep said

slag molten and to supply heat to the liquid steel in the mold; the improvement comprising, in a first stage, maintaining the electric current through said electrode and slag and steel at a level to supply just the amount of heat to the slag bath and metal in the top of the mold which is needed to maintain the layer of slag and only that part of the metal bath beneath the



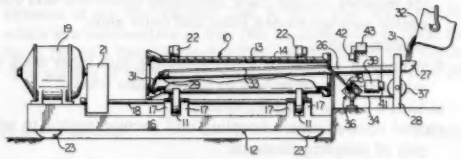
slag and contained in the top of the mold in a molten state while metal elsewhere in the mold solidifies and the level of the molten metal at the top of the mold decreases due to shrinkage of the metal in the mold upon solidification; and in a second stage increasing the current through the electrode and slag and steel sufficiently to melt a portion of the electrode to restore the original level of the steel in the mold.

4,036,279

METHOD OF TREATING MOLTEN METAL IN CENTRIFUGAL CASTINGS

John R. Nieman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 8, 1976, Ser. No. 721,655
Int. Cl.² B22D *27/20, 13/02*
U.S. Cl. 164—57 **5 Claims**



1. A method of centrifugal treating molten metal in casting comprising the steps of:

supporting an elongated hollow casting mold on a plurality of rollers with its longitudinal axis disposed substantially horizontal;

positioning a pouring chute with its discharge end disposed within the hollow casting mold and its receiving end outside of the hollow casting mold, the discharge end being lower than the receiving end;

positioning a guide member adjacent the pouring chute with one of its ends being adjacent the discharge end of the pouring chute;

rotating the casting mold by powerably driving at least one of the rollers;

pouring a molten base metal from a ladle into the receiving end of the pouring chute so that the molten base metal flows in a stream through the pouring chute and from the discharge end into the rotating casting mold;

feeding a treating agent in wire form from a wire feed mechanism along the guide member and into the stream of molten base metal adjacent the discharge end of the pouring chute for meltably intermixing therewith; and

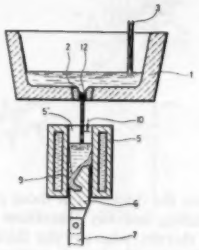
controlling the wire feed mechanism and hence the feed rate of the wire in direct proportion to the flow rate of the molten base metal through the pouring chute.

4,036,280

METHOD OF STARTING THE CASTING OF A STRAND IN A CONTINUOUS CASTING INSTALLATION

Adalbert Röhrig, Wadenswil; Fritz Willim, Birmensdorf, both of Switzerland, and Brian Hannah, Kempton Park, Transvaal, South Africa, assignors to Concast AG, Zurich, Switzerland

Filed July 16, 1976, Ser. No. 705,800
Claims priority, application Switzerland, July 18, 1975, 9423/75
Int. Cl.² B22D *11/08*
U.S. Cl. 164—82 **7 Claims**



1. A method for starting-up the casting of a continuously cast strand, comprising the steps of:

a. providing a continuous casting mold equipped with a dummy bar having a dummy bar head for starting-up the continuous casting of a molten metal;

b. providing a tundish having a bottom pouring outlet;

c. prior to the start of casting inserting at least one meltable body into the bottom pouring outlet of the tundish to effect partial reduction in the cross-sectional area of said outlet;

d. teeming the molten metal from the tundish into the continuous casting mold;

e. reducing the throughflow rate of the molten metal teemed from the tundish into the continuous casting mold by means of the meltable body during a time interval lasting from the start of teeming the molten metal into the continuous casting mold until reaching a predetermined level of the molten metal in the continuous casting mold while melting the meltable body inserted into the bottom pouring outlet; and

f. accommodating the melting time of the meltable body to said time interval by selecting any one of at least its dimensions, the material from which it is formed, or both.

4,036,281

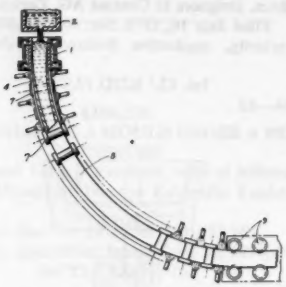
METHOD FOR CONTINUOUSLY CASTING A SLAB

Irving Rossi, Dunros Farm, James St., Morristown, N.J. 07960

Filed Oct. 3, 1975, Ser. No. 619,464
Int. Cl.² B22D *11/124*
U.S. Cl. 164—89 **3 Claims**

1. The method of continously casting a steel strand in the form of a rectangular slab having opposed wide side walls and opposed narrow end walls joining said wide side walls which comprises pouring molten steel into the upper end of a chilled mold having a mold passage of substantially rectangular cross section, continuously withdrawing from said mold a partially solidified strand comprising relatively thin soldified side and end walls forming an outer shell surrounding an inner molten core, subjecting the surfaces of said narrow end walls and the surfaces of the wide side walls immediately adjoining them to

very intensive cooling below said mold by applying coolant fluid directly onto said surfaces to rapidly build up soldified metal in said narrow end walls and in portions of said side walls immediately adjoining said end walls, simultaneously subjecting the other surfaces of said wide side walls extending laterally therefrom to less intensive cooling by applying coolant fluid directly onto said surfaces so that there is a differential in the intensity of the cooling applied to the respective surfaces, the coolant applied to said narrow end surfaces and to said immediately adjoining wide side surfaces being applied at sufficiently high intensity to increase the wall thickness of said end walls and of the immediately adjoining wide side walls



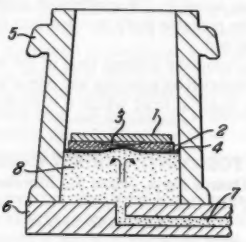
more rapidly than the thickness of those portions of said wide side walls extending laterally therefrom is increased by the coolant applied thereto, whereby the thickened end walls and immediately adjoining thickened portions of said wide side walls act as the ends of constrained beams to support and resist deflection of remaining portions of the wide side walls caused by the ferrostatic pressure of said molten core, and continuously applying coolant fluid to said narrow end and wide side surfaces of such differential intensities along continuous areas of said surfaces extending longitudinally of said strand from the level where the strand emerges from the mold to the level where the walls of said shell become self-sustaining.

4,036,282

PROCESS OF INGOT CASTING

Hidetoshi Asahara, Kobe, Japan, assignor to Foseco International Limited, Brimingham, England

Filed Sept. 2, 1975, Ser. No. 609,805
Claims priority, application Japan, Sept. 4, 1974, 49-101603
Int. Cl.[2] B22D *27/00*
U.S. Cl. 164—123 **13 Claims**



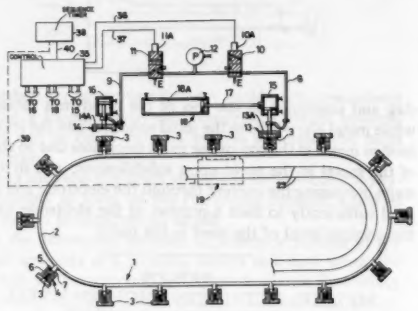
1. In a process for producing an ingot from a molten metal by bottom pouring molten metal into an ingot mould, the improvement which comprises locating in the ingot mould, prior to the commencement of pouring, a multi-layered board having a first layer which is a preformed slab comprising an anti-piping composition including an exothermic material and a second layer adjacent the first layer which is a preformed slab comprising a fluxing agent, a fibrous material and a binder, the second layer having a central cavity therein filled with a preformed refractory slab comprising a refractory material, a fibrous material and a binder, the slabs being arranged such that the refractory slab is enclosed within the board, and the board being located in the mould with the first layer uppermost.

4,036,283

RAIL CONVEYOR FOR FOUNDRY MOLDING BOXES

Herbert Grolla, Laasphe, Westphalia, Germany, assignor to Heinrich Wagner Maschinenfabrik, Laasphe, Westphalia, Germany

Continuation-in-part of Ser. No. 550,428, Feb. 18, 1975, abandoned. This application July 22, 1976, Ser. No. 707,613
Claims priority, application Germany, Mar. 1, 1974, 2409851
Int. Cl.[2] B22C *15/22*
U.S. Cl. 164—160 **5 Claims**



1. In a rail conveyor apparatus, comprising:

a plurality of rail conveyor trucks coupled together and movably supported on a rail and at least one foundry molding box mounted on each rail conveyor truck, each of said foundry molding boxes having a vacuum connector member on said truck associated therewith, said connector member having inner and outer ends;

a vacuum source;

first conduit means for interconnecting said inner ends of said connector members to said vacuum source;

at least a pair of coupling elements;

second conduit means coupling said vacuum source to said pair of coupling elements;

valve means in said second conduit means for alternately connecting said coupling elements to said vacuum source;

coupling head means connected to at least one of said coupling elements for effecting a coupling of at least one of said coupling elements to said outer end of one of said connector members on one of said rail conveyor trucks prior to an uncoupling of the other of said coupling elements from said outer end of another connector member on another rail conveyor truck; and

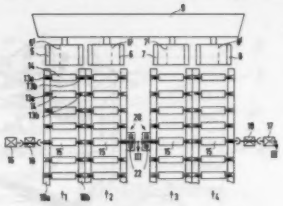
drive means connected to at least one of said pair of coupling elements for driving at least one of said pair of coupling elements in timed sequence with the movement of said rail conveyor trucks and said connector trucks and said connector members thereon whereby a vacuum is provided in said first conduit means for the period of time that said coupling head means couples said one coupling element to said one connector member so that said vacuum source is continuously maintained in coupled relation to said first conduit means.

4,036,284

CONTINUOUS CASTING APPARATUS FOR SLABS

Rudolf Hoffmann, Heyenfeldweg 50a, Krefeld, Germany (415)

Filed Mar. 8, 1976, Ser. No. 664,564
Claims priority, application Germany, Mar. 19, 1975, 2511913
Int. Cl.[2] B22D *11/128*
U.S. Cl. 164—280 10 Claims



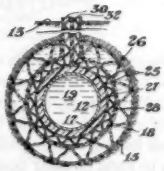
1. Continuous casting apparatus for slabs, comprising:
first and second mould means, arranged in closely spaced, side-by-side relationship;
a common distributor groove for supplying melt to said mould means;
first and second independent guide tracks operatively connected respectively to said first and said second mould means, and arranged in side-by-side relationship located as closely adjacent each other as possible, each of said independent guide tracks having idler rollers and individually driven rollers for guiding a cast slab;
first motor means located on the free outside of said first guide track, and connected to the driven rollers of said first guide track;
second motor means also located on the free outside of said first guide track; and
drive shaft means extending across said first guide track from said second motor means to the driven rollers of said second guide track, and connected to said driven rollers of said second guide track.

4,036,285

ARRANGEMENT TO CONTROL HEAT FLOW BETWEEN A MEMBER AND ITS ENVIRONMENT

John S. Best, Frankenmuth, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 331,089, Feb. 9, 1973, Pat. No. 3,948,313, which is a continuation of Ser. No. 112,636, Feb. 4, 1971, Pat. No. 3,768,547. This application Dec. 10, 1975, Ser. No. 639,334
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.[2] E21B *43/24*
U.S. Cl. 165—45 4 Claims



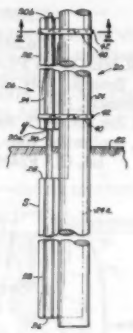
1. An arrangement to remove excess heat from an underground fluid line, said arrangement comprising a thermal bleed exposed directly to the line to dissipate heat from the line, said thermal bleed comprising a cell structure providing means for bleeding excess quantities of heat from said line to the atmosphere by natural heat transfer mechanism, said thermal bleed extending substantially about the periphery of said line, a heat sink located between said thermal bleed and earth supporting said line, said heat sink of sufficient capacity to prevent heat from such line from reaching said earthen support.

4,036,286

PERMAFROST STABILIZING HEAT PIPE ASSEMBLY

John H. Anderson, and Elmer D. Waters, both of Richland, Wash., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 303,221, Nov. 2, 1972, Pat. No. 3,823,769. This application Apr. 22, 1974, Ser. No. 462,916
The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—45 4 Claims



1. In a structural support installation in a permafrost or similar environment, an improved permafrost stabilizing assembly comprising:
a support structure including a tubular body having a normally lower portion thereof installed in a generally permafrost-like medium, said support body having a accommodation space therein, and means for sealing said lower body portion at a lower end thereof to produce an accommodation space which is closed at its lower end;
at least one heat pipe element including a cylindrical tubular container having a charge of working fluid therein, said container comprising a normally lower portion including a predetermined part which is installed in said accommodation space, and a normally upper portion including a predetermined part adapted to be coupled to a heat exchanger at least partially exposed to a generally atmosphere-like medium, said accommodation space being comparatively large laterally in respect to said lower container portion, said predetermined part of said lower container portion being installed in said accommodation space at least in proximity longitudinally to an inner surface of said support body, and said upper container portion having a wall sufficiently strong and thick to allow safe processing work thereon;
a first substance having a thermal conductivity greater than air generally filling said accommodation space remaining between said support body and said lower container portion of said at least one heat pipe element; and
at least one heat exchanger including a radiator having a cylindrical tubular body, and heat transferring fins affixed to a predetermined part thereof, said radiator body having a cylindrical coupling surface generally positioned concentrically at least in proximity to said predetermined part of said upper container portion of said at least one heat pipe element, and said predetermined part of said upper container portion of said at least one heat pipe element of said radiator body with its cylindrical coupling surface being sized to provide for an interference press fit such that said radiator body can be press-fitted on said prede-

termined part of said upper container portion for attachment thereto,

whereby heat picked up by said support body from said permafrost-like medium is conducted at least partially by said first substance to said predetermined part of said lower container portion of said at least one heat pipe element installed in said accommodation space and transported by said working fluid in vaporized form to said predetermined part of said upper container portion of said at least one heat pipe element coupled to said at least one heat exchanger for transfer to said atmosphere-like medium accompanied with condensation of said vaporized working fluid for return to said predetermined part of said lower container portion of said at least one heat pipe element.

4,036,287

RADIATOR FOR HEATING PLANTS WITH ELEMENTS

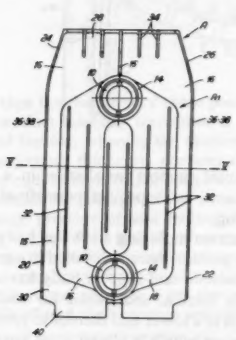
Giuseppe Perani, Brescia, Italy, assignor to Fonderie F. Ili Perani S.p.A., Brescia, Italy

Filed Jan. 29, 1975, Ser. No. 545,217

Claims priority, application Italy, Feb. 1, 1974, 20683/74

Int. Cl.[2] F24H *9/04*

U.S. Cl. 165—55 **7 Claims**



1. A radiator for heating plants consisting of a plurality of tubular elements arranged side by side and in successive order, said tubular elements being mechanically connected and hydraulically connected to each other by means of upper and lower lateral connections wherein each of said tubular elements consists of a hollow tubular plate housed in a substantially parallelepipedically shaped block with a tapered open top and an open bottom, said block being provided, at the edge of its faces, with upright coplanar wings alignable head against head with the wings of the adjacent elements to form, between said elements, chimneylike ducts, the upper openings of which have a smaller cross-section than the lower openings to increase the circulation of hot air, and side upper openings being defined by matching notches in the edges of said coplanar wings to further increase the circulation of hot air.

4,036,288

RADIATOR, ESPECIALLY FOR THE AIR-CONDITIONING SYSTEM OF AN AUTOMOBILE

Rene Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

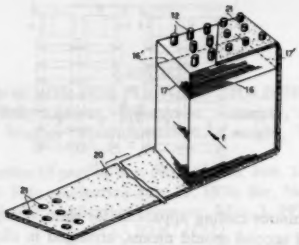
Filed July 10, 1975, Ser. No. 594,620

Claims priority, application France, July 10, 1974, 74.23998

Int. Cl.[2] F28D *1/04, 7/00;* F28F *1/30, 9/00*

U.S. Cl. 165—69 **3 Claims**

1. A radiator adapted to be used in the air conditioning system of an automotive vehicle having water tanks and an air duct, the radiator comprising a plurality of tubes extending between said water tanks, a stack of fins affixed to and traversed by said tubes, means for connecting said water tanks to a circuit of primary fluid circulating through said tubes, means for circulating a secondary fluid through said stack of fins in a direction substantially prallel to said fins and thus substantially perpendicular to said tubes, and a gasket for the air tight mounting of the radiator within said air duct of said air conditioning sytem, said gasket being made of a single flat band of foam material applied against the edges of said fins, having a



width at least equal to that of the dimension of the fins measured parallel to the direction of flow of said secondary fluid through the radiator, the length of said band being at most equal to the perimeter of a longitudinal section of the stack of fins, said band being applied onto said fins with a slight tension and having holes through which the end portions of the tubes protrude with respect to the stack of fins to maintain said band in position with respect to said fins.

4,036,289

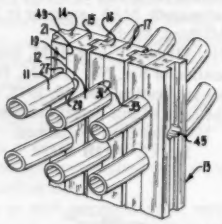
HEAT EXCHANGER TUBE BUNDLE SUPPORT SYSTEM

Shih-che Cheng, San Diego, and Jay Stephen Kaufman, Del Mar, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jan. 20, 1975, Ser. No. 542,518

Int. Cl.[2] F28D *7/00;* F28F *9/00*

U.S. Cl. 165—82 **5 Claims**



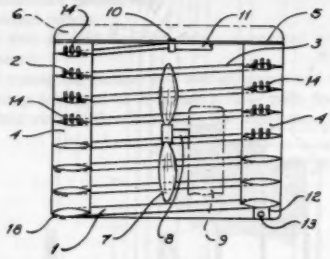
1. In a heat exchanger, a tube bundle comprising a plurality of coaxil convoluted tubes with the convolutions of the respective tubes having different radii, and a spacer structure comprising a plurality of elongated parallel bars arranged in pairs, said bars in each pair having abutting surfaces with semicircular recesses therein to form circular openings accommodating the convolutions of one of said tubes means intermediate their ends securing said bars in each pair together such as to cause said bars in each pair to claim the convolutions of the associated tube in said circular openings, said bars in adjacent pairs having facing surfaces formed in an interfitting tongue and groove configuration extending continuously the full length thereof, said tongues and grooves having radial and circumferential clearances therein sufficient to accommodate radial and circumferential thermal expansion differences in the adjacent tubes.

4,036,290

HELICAL EXPANSION CONDENSER

Donald A. Kelly, 58-06 69th Place, Maspeth, New York, N.Y. 11378

Filed Jan. 24, 1972, Ser. No. 219,985
Int. Cl.² F28B 1/06; F28D 15/00
U.S. Cl. 165—105 8 Claims



1. A helical expansion condenser consisting of a continuous helical coil of elliptical cross-section with a vapor entrance at the top and a condensate exit at the bottom,

multiple flat fin spacing means vertically disposed between the coils of said continuous helical coil,

a perforated metal sheet uniformly disposed and secured to the top of said continuous helical coil,

multiple uniform fins secured to the top of said perforated metal sheet,

a centrally disposed cooling fan and drive means within the said continuous helical coil,

sealed vapor entrance connection means disposed at the top of said continuous helical coil,

sealed condensate exit means disposed at the bottom of said continuous helical coil,

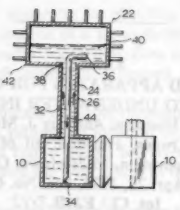
multiple short heat pipes angularly and uniformly disposed midway into the top surface of said continuous helical coil, weld joining and sealing of each said heat transfer pipe onto the top surface of said continuous helical coil.

4,036,291

COOLING DEVICE FOR ELECTRIC DEVICE

Gai Kobayashi, and Yoshiro Shikano, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1975, Ser. No. 559,393
Claims priority, application Japan, Mar. 16, 1974, 49-30486
Int. Cl.² H01L 23/42
U.S. Cl. 165—105 7 Claims



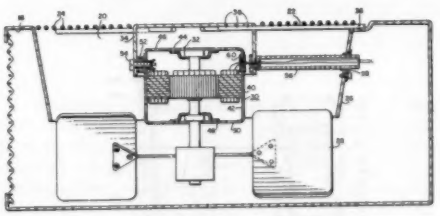
1. A vapor cooling device for an electric device comprising, in combination, at least one vapor cooling means having charged therein an amount of a condensible coolant in the form of a liquid phase capable of removing heat generated from an electric device by changing said coolant from its liquid phase to its vapor phase, condenser means disposed above said vapor cooling means, a connection tube member for connecting said vapor cooling means to said condenser means to put both means in fluid communication, said condenser means condensing the coolant in its vapor phase from said vapor cooling means into its liquid phase through the phase change, said coolant in its liquid phase further filling said condensor means to include a liquid surface positioned above the junction of said connection tube member and said condenser means, and at least one auxiliary tube member disposed within said connection tube member including an upper end portion extending from the junction of said connection tube member and said condenser means and bent extending laterally and opening within said condenser means below said liquid surface of said coolant and also including a lower end opening within said vapor cooling means, said vapor cooling means, said condenser means, said connection tube member and said auxiliary tube member forming a closed coolant loop.

4,036,292

REFRIGERATION CONDENSER

Louis P. Hine, Jr., Pleasanton, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1975, Ser. No. 624,353
Int. Cl.² F24H 3/06; F28F 13/12
U.S. Cl. 165—122 7 Claims



1. A refrigeration condenser including:

a housing containing a condenser coil and having side walls and a top wall, said top wall having an opening for the flow of condensing air therethrough;

motor shield and support means in the center of said top wall opening;

a vertical shaft fan motor having an enclosing shell, said shell being supported directly from said motor shield and support means;

a fan secured to said motor shaft below said motor; and

a series of radial spokes having their radially outer ends rigidly secured to said housing at the perimeter of said top wall opening and extending in a substantially straight line to said motor shield and support means with their radially inner ends rigidly secured to said motor shield and support means so that the weight of said motor and fan is borne in part at least by tension in said spokes.

4,036,293

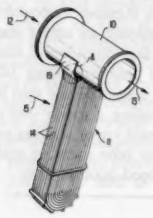
HEAT EXCHANGER FOR GASES OF GREATLY VARYING TEMPERATURES

Eggert Tank, Fellbach, and Manfred Stute, Esslingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed June 7, 1974, Ser. No. 477,187
Claims priority, application Germany, June 9, 1973, 2329634; June 9, 1973, 2329636
Int. Cl.² F28F 19/00
U.S. Cl. 165—134 54 Claims

43. A heat-exchanger for gases of greatly varying temperatures, comprising a collective chamber means for the colder gases and a metal recuperator means having a number of pipes which are fastened to the collective chamber means, the hotter gases thereby flowing through between the pipes of the recuperator means, characterized by protective means arranged within the area of the connecting places between the pipes of the recuperator means and the collective chamber means for protecting the connecting places against the hot gases, and in

that the protective means covers off the pipe-connecting places directly exposed to the inflowing hot gases and is constructed



bent approximate S-shaped in cross section and adjoins tangentially the outer wall of the collective chamber means.

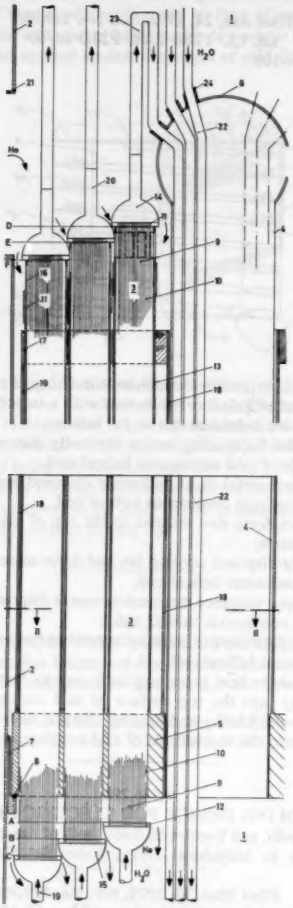
4,036,294

HEAT EXCHANGER ASSEMBLY DESIGNED AS A LONGITUDINAL COUNTERFLOW DEVICE

Hans Ecker, Ludwigshafen, Germany, assignor to Hochtemperatur-Reaktorbau GmbH, Cologne, Germany

Filed Apr. 15, 1976, Ser. No. 677,237
Claims priority, application Germany, Apr. 22, 1975, 2517693
Int. Cl.[2] F28D 7/10
U.S. Cl. 165—154 **11 Claims**

1. A heat exchanger assembly of the counterflow type having a vertically extending longitudinal configuration comprising a plurality of individual tube nests each of said nests being formed of a plurality of individual tubes adapted to have a first heat exchange medium flow therethrough, tube plates connected to the ends of said tubes between which said tubes extend, a guide shell surrounding each of said tube nests for effecting therein flow of a secondary heat exchange medium around the individual tubes of said tube nest, each of said tube nests being formed by its associated guide shell and tube plates as individual boxes, said boxes thus formed, when viewed in a plane extending transversely to the longitudinal direction of said heat exchanger assembly, being arranged as a hexagonal grid, a supporting structure generally located in the bottom region of said vertically extending heat exchanger assembly and having said boxes welded thereto, a housing for said heat exchanger assembly surrounding said hexagonal grid of boxes and forming together with said supporting structure a tight joint to enclose said assembly, a central guide shell located centrally of said hexagonal grid and surrounded by said boxes, said central guide shell enclosing therein a plurality of return tubes for returning to said tubes forming said tube nests the heat exchange medium flowing therethrough, and a hood enclosing said central guide shell and having said return tubes



extending therethrough with said return tubes welded to said hood.

4,036,295

METHOD AND APPARATUS FOR CONNECTING FLOWLINES TO UNDERWATER INSTALLATIONS

Kerry G. Kirkland, Houston; Anthony J. Masciopinto, Humble, and James H. Owens, Houston, all of Tex., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 22, 1976, Ser. No. 679,226
Int. Cl.[2] E21B 7/12
U.S. Cl. 166—.6 **14 Claims**

1. In an underwater installation of the type in which a flowline to be laid along the bottom of a body of water is connected to a flow unit which is supported adjacent the bottom of the body of water, the combination of

a permenent base mounted adjacent the bottom of the body of water and comprising

locator means in a fixed relation relative to the installation, and

means for connection to elongated guide means to extend

from the surface of the body of water to the underwater installation;

a flowline;

a flowline base assembly superimposed on said permanent base and comprising

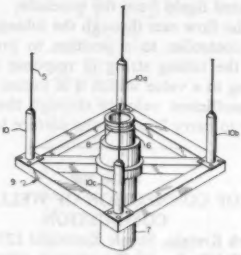
means operatively related to said locator means to locate said flowline base assembly in a predetermined position relative to said locator means,

connector means, and

swivel means;

one end of said flowline being connected to said swivel means;

said connector means, said swivel means and said flowline being arranged to establish a flow path for conducting fluid via said flowline when the installation is complete,



said swivel means being constructed and arranged for free swivelling about a swivel axis which is aligned with a portion of said flow path;

a flow unit base superimposed on said flowline base assembly,

said flow unit base carrying the flow unit of the underwater installation and including means operatively related to said locator means of said permanent base to locate the flow unit in a predetermined position relative to said locator means and therefore also in a predetermined position relative to said flowline base assembly; and

remotely operated power means for establishing connection between the flow unit and said swivel means via said connector means.

4,036,296

SUBSURFACE WELL APPARATUS

James D. Mott, Houston, Tex., and Tosh Miyagishima, Simi, Calif., assignors to Hydril Company

Filed May 23, 1975, Ser. No. 580,240

Int. Cl.[2] E21B *43/12*

U.S. Cl. 166—322 **10 Claims**

1. An improved apparatus for effecting operation of a rotatable ball closure element of a through-the-bore movable subsurface safety valve for controlling flow of well fluids through the bore of a well tubing at a desired subsurface location, including:

a tubular frame means movable through the bore of a tubing to and from a subsurface location in a well;

means with said frame means for releasably securing said frame means with the well tubing at the desired subsurface location;

a ball closure element having an outer spherical surface and a flow opening formed therethrough;

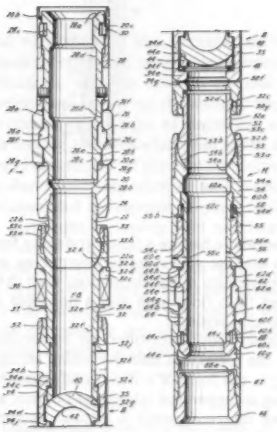
annular seat means formed by said frame means having a central opening therethrough for sealingly engaging with said outer spherical surface of said ball closure element to block passage of fluid between said ball closure element and said seat means, said ball closure element rotatable on said seat means to and from an open position aligning said flow opening with a central opening of said annular seat means for enabling flow and a closed position with said flow opening out of communication with said central opening to block flow of fluid with said ball closure element;

cage means partially surrounding said ball closure element and connected with said annular seat means for pivotally connecting with said ball closure element to hold said ball closure element adjacent said annular seat means during rotation of said ball closure element; and

operator means partially surrounding said ball closure element for effecting rotation of said ball closure element, said operator means including:

a longitudinally bisected operator sleeve having longitudinally extending slots formed in said operator sleeve on opposite sides of said ball to provide clearance for enabling controlled longitudinal movement of said longitudinally bisected operator sleeve relative to said cage means;

a first securing ring mounted with said longitudinally bisected operator sleeve above said ball closure element to secure said first and second portions of said longitudinally bisected operator sleeve as a unit for simultaneous movement;



a second securing ring mounted with said longitudinally bisected operator sleeve below said ball closure element to secure said first and second portions of said operator sleeve as a unit for simultaneous movement;

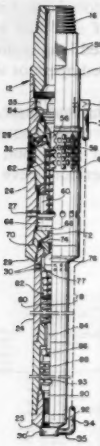
means carried by said longitudinally bisected operator sleeve for engaging said ball closure element to rotate said ball closure element to and from the open and closed position when said operator sleeve moves longitudinally relatively to said cage means;

means connected with said longitudinally bisected operator sleeve for effecting longitudinal operating movement of said bisected operator sleeve to rotate said ball closure element to and from the open and closed position, said means for effecting longitudinal operating movement including a first tubular operator portion and a second tubular operator portion having a universal joint connection therebetween to enable flexing of said first tubular portion relative to said second tubular portion for enabling flexing of said operator means during passage of said operator means through curves in the tubing.

4,036,297
SUBSURFACE FLOW CONTROL APPARATUS AND METHOD

Patrick S. Swihart, Sr., 3507 Baumann, Midland, Tex. 79701

Continuation-in-part of Ser. No. 560,350, March 21, 1975, Pat. No. 3,968,839. This application July 2, 1976, Ser. No. 702,144
Int. Cl.[2] E21B *43/12, 47/06*
U.S. Cl. 166—250 15 Claims



1. In a borehole having a fluid producing formation location downhole therein, and a production tubing extending downhole into proximity of the formation, with the tubing forming a produced fluid flow path and a borehole annulus, the improvement comprising:

a subsurface flow controller for controlling flow of fluid from the formation into the tubing string, said controller being in the form of a fluid conducting hollow body and having an upper and lower end portion, said hollow body having means forming a piston chamber, a production inlet chamber, and a production outlet chamber therewithin;

said piston chamber having a piston reciprocatingly received therewithin and dividing the last said chamber into an upper and lower piston chamber;

a pilot valve, means by which said pilot valve is actuated in response to the pressure differential between the bottomhole pressure and the tubing pressure above the tool to thereby control the flow of produced fluid into and out of said lower piston chamber;

a production valve seat separating said production outlet chamber from said production inlet chamber, a production valve element having means by which it is actuated by said piston from an opened to a closed position for controlling fluid flow through said production valve seat; a choke forming a produced fluid inlet into said production inlet chamber; means forming a bleed port which is arranged respective to the piston so that downhole pressure is effected within said upper piston chamber when said production valve is closed and which is effected within said lower piston chamber when said production valve is moved to the open position; and means biasing said production valve element towards the closed position;

so that increased bottomhole pressure opens said pilot valve to cause said piston to open said production valve element, and fluid flow can occur through said production valve seat until a reduced flow rate through the last said seat causes the production valve element to assume a closed position.

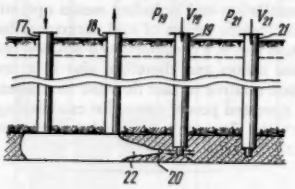
9. Method of controlling mixed liquid and gaseous fluid flow from a producing formation located downhole in the borehole, wherein the produced fluid flows uphole through a production tubing string, comprising the steps of:

1. locating a flow controller downhole in a borehole in proximity of the production formation;
2. connecting the flow controller to the tubing string so that fluid flow through the tubing string is controlled by the action of the controller;
3. sensing the pressure differential between the formation pressure and tubing pressure, and moving the controller to a fluid flow position in response to the bottomhole pressure increasing to a value which will expel most of the accumulated liquid from the borehole;
4. sensing the flow rate through the tubing string and moving the controller to a position to prevent fluid flow through the tubing string in response to the flow rate decreasing to a value which is in excess of a rate of flow where insufficient velocity through the tubing string is available to carry liquid to the surface by entrainment.

4,036,298
METHOD OF CONNECTION OF WELLS BY IN-SITU COMBUSTION

Efim Vulfovich Kreinin, Starye Kuzminki 127a Kvartal, 9b, kv. 69, and Kirill Nikolaevich Zvyagintsev, ulitsa Dolgoprudnaya, 13a, kv. 51, both of Moscow, U.S.S.R.

Filed Aug. 12, 1975, Ser. No. 603,820
Claims priority, application U.S.S.R., Aug. 21, 1974, 2056358
Int. Cl.[2] E21C *43/00*
U.S. Cl. 166—251 3 Claims



1. A method of mine-less connection of a series of first, second, third and successive wells for underground gasification via a unitary gasification channel by the fire infiltration technique, comprising the steps of: setting a combustion center by igniting the mineral bed in a first well to be connected by the gasification channel; forcing a gaseous, oxygen-containing blast at a permanent flow rate into a second well; measuring the pressure of the blast forced into the second well; and forcing a gaseous, oxygen-containing blast into a third well upon the pressure of the blast in the second well dropping considerably, each of the wells being disposed adjacent the preceding well in the series and in the direction of formation of the gasification channel.

4,036,299
ENRICHING OFF GAS FROM OIL SHALE RETORT

Chang Yul Cha, Bakersfield, Calif., and Richard D. Ridley, Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

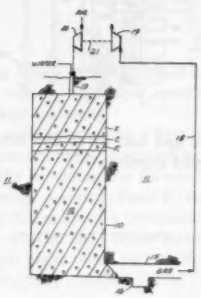
Continuation-in-part of Ser. No. 492,289, July 26, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,558
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—261 47 Claims

1. A method of recovering liquid and gaseous products from fragmented oil shale in an in situ oil shale retort in which a

combustion zone is advanced therethrough, which comprises the steps of:

establishing a combustion zone having a temperature higher than about 800° F in the fragmented oil shale in the in situ oil shale retort;

introducing into said combustion zone, in the direction in which said combustion zone is to be advanced, a gaseous feed mixture comprising an oxygen supplying gas and water vapor at a rate sufficient to maintain the temperature in said combustion zone at a temperature higher than about 800° F and to advance said combustion zone through the in situ oil shale retort, and producing combustion product gases in said combustion zone;



passing flue gas, comprising said combustion product gases and unreacted gaseous feed mixture gases, from the combustion zone through the fragmented oil shale in the in situ retort in the direction of the advancement of said combustion zone, thereby retorting oil shale in a retorting zone on the advancing side of said combustion zone to produce liquid and gaseous products;

condensing water vapor on unretorted oil shale on the advancing side of the retorting zone to form liquid water; and

withdrawing liquid water, said liquid product and retort off gas comprising said gaseous products and said flue gas from the in situ oil shale retort on the advancing side of said combustion zone.

4,036,300

MICELLAR FLOODING PROCESS

LeRoy W. Holm, and Donald H. Ferr, both of Fullerton, Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed June 23, 1976, Ser. No. 699,199

Int. Cl.² E21B *43/22*

U.S. Cl. 166—273 **30 Claims**

1. In a method for recovering petroleum from a subterranean reservoir including the steps of injecting into said reservoir through an injection well a micellar displacement system comprising a micellar solution and an aqueous phase, and thereafter injecting an aqueous flooding medium to drive said micellar displacement system towards a spaced production well from which fluids are recovered, the improvement which comprises:

introducing into said reservoir with said micellar displacement system a chelating agent in an amount in excess of that amount required to chelate multivalent cations contained in said aqueous phase of said micellar displacement system, said chelating agent being selected from the group consisting of aminopolycarboxylic acids, the ammonium salts and the alkali metal salts thereof.

4,036,301

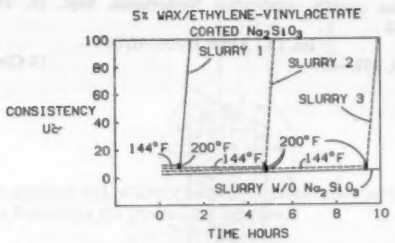
PROCESS AND COMPOSITION FOR CEMENTING CASING IN A WELL

Charles A. Powers; George B. Holman, both of Tulsa, and Robert C. Smith, Inola, all of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 518,543, Oct. 29, 1974, abandoned, which is a division of Ser. No. 561,518, March 24, 1975, abandoned. This application July 12, 1976, Ser. No. 704,717

Int. Cl.² E21B *33/14*

U.S. Cl. 166—293 **13 Claims**



11. A method of preserving the desirable short wait-on-cement time characteristic of an accelerated cement slurry in cementing applications, wherein external retarder-type contamination is anticipated, involving the specific improvement of adding to the cement slurry, prior to placement, an encapsulated accelerator having a coated which will soften and melt at the temperatures characteristic of the cement placement, placing said cement slurry with said encapsulated accelerator and holding said encapsulated accelerator in place such that said coating softens and melts, releasing said accelerator which promotes a rapid set of said cement slurry.

13. A cement slurry comprising from about 2 parts by weight to about 15 parts by weight anhydrous sodium metasilicate granules per 100 parts by weight dry cement, wherein said anhydrous sodium metasilicate granules are isolated from the slurry by an external coating or organic wax.

4,036,302

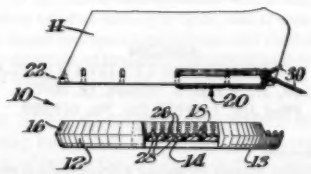
HORSESHOE MANUFACTURE

Dudley W. C. Spencer, 619 Skipley Road, Wilmington, Del. 19801

Continuation-in-part of Ser. No. 614,766, Sept. 18, 1975, Pat. No. 4,013,126, which is a continuation-in-part of Ser. No. 426,446, Dec. 20, 1973, Pat. No. 3,917,000, which is a continuation-in-part of Ser. No. 71,121, Sept. 10, 1970, Pat. No. 3,664,428. This application Apr. 5, 1976, Ser. No. 673,371

Int. Cl.² A01L *3/00*

U.S. Cl. 168—4 **23 Claims**



1. A horseshoe assembly comprising a shoe element, said shoe element having a body member with a lower wear surface and an upper securing surface, adhesive means on said shoe element, hoof-threading means for being threaded through holes in a horse's hoof, said hoof threading means being in the

form of a lace being flexible and non-toxic and absorbtive, said adhesive means being intimately secured to said lace, and said lace having a breaking strength less than the strength of the horse's hoof.

4,036,303

SOIL CULTIVATING MACHINES

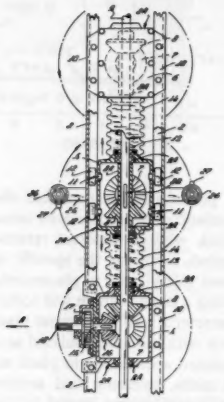
Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N. V., Maasland, Netherlands

Filed Sept. 16, 1975, Ser. No. 613,901

Claims priority, application Netherlands, Sept. 18, 1974, 7412332

Int. Cl.[2] A01B *33/06, 61/04*

U.S. Cl. 172—49 **12 Claims**



1. A soil-cultivating machine comprising an elongated frame and a plurality of adjacent soil-working members mounted on said frame in row that extends horizontally and transverse to the direction of travel, said soil-working members during operation, being positioned side-by-side and working overlapping strips of soil, said members being rotatably mounted on corresponding upwardly extending shafts and driving means including a pinion transmission means engaging the shafts of said soil-working members and rotating same about upwardly extending axes defined by said shafts, displaceable means interconnecting at least one of said soil-working members to said frame and said soil-working member, its upwardly extending shaft and a respective pinion transmission connection as a unit, being displaceable out of a normally central position and deflectable in a generally horizontal direction against resilient opposition in either one of two opposite directions, with respect to a neighboring soil-working member.

4,036,304

WHEEL MOUNTING FOR CULTIVATOR PLANTER

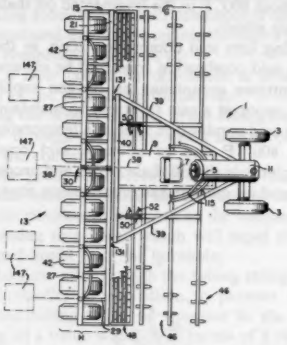
Arthur F. Crow, Jr., R.F.D. 3, Milford, Ill. 60953

Filed Jan. 14, 1976, Ser. No. 649,089

Int. Cl.[2] A01B *71/00*

U.S. Cl. 172—260 **9 Claims**

1. A cultivator planter including a drive section and a driven section, the driven section being forwardly positioned with respect to the drive section, the drive section including a plurality of traction wheels and a frame of substantial width from which said plurality of traction wheels are mounted, said frame being formed in two longitudinally extending sections, means provided on the adjacent ends of said two sections for releasably locking said sections together, the driven section including manually operable steering wheels and a plurality of cultivating implements and said drive and driven sections being releasably connected together.



4,036,305

GANG PLOW

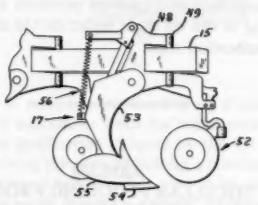
Jon E. Kinzenbaw, Ladora, Iowa, assignor to DMI Inc., Goodfield, Ill.

Division of Ser. No. 432,894, Jan. 14, 1974, Pat. No. 3,918,528, Division of Ser. No. 226,903, Feb. 16, 1972, Pat. No. 3,817,333. This application June 12, 1975, Ser. No. 586,146

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.[2] A01B *69/00*

U.S. Cl. 172—283 **1 Claim**



1. In an adjustable plow system including a main beam adapted to be pulled behind a traction vehicle and inclined relative to the direction of travel of said vehicle, the improvement comprising a plurality of moldboard plow units rotatably mounted to said beam for movement about vertical axes, each unit comprising:

a yoke straddling said beam and including an upper portion extending above said beam and a lower portion extending beneath said beam and directly beneath said upper portion of said yoke; a shaft carried by said beam and connected to said upper and lower portions of said yoke and having an axis extending vertically; and mounting means for pivotally mounting said unit to permit said yoke to be rotated about said axis of said shaft over a continuous range;

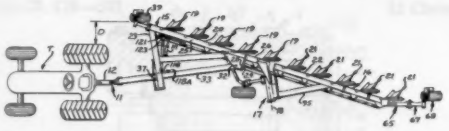
means connecting said units together so that they rotate in unison; and

means for rotating said units to adjust the lateral spacing thereof.

4,036,306
MULTI-UNIT ADJUSTABLE PLOW PULLED BY VEHICLE AND HAVING STEERING WHEEL TURNABLE ONLY ON ADJUSTMENT OF PLOW

Jon E. Kinzenbaw, Williamsburg, Iowa, assignor to DMI Inc., Goodfield, Ill.

Filed Sept. 29, 1975, Ser. No. 617,891
Int. Cl.[2] A01B *69/00*
U.S. Cl. 172—287 7 Claims



1. In combination with a vehicle, a plow system adapted to be pulled by said vehicle, said flow system comprising: an articulated main frame including

a forward frame section including a first inclined beam,

a rear frame section including a second inclined beam, and

means for pivotally mounting the forward end of said rear frame section to the rear end of said forward frame section for pivotal movement about a horizontal axis, the axes of said first and second inclined beams extending generally in the same vertical plane when said system is in operation;

hitch means for pivotally connecting said main frame to said vehicle;

a first plurality of plow units mounted for rotation about vertical axes to said first inclined beam;

a second plurality of plow units mounted for rotation about vertical axes to said second inclined beam;

power means for rotating said plow units in unison to adjust the cut between adjacent units;

support wheel means for supporting said system including a steering wheel mounted for steering motion about a vertical axis on unplowed ground when said system is in operation;

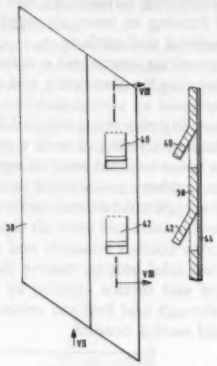
linkage means responsive to the adjustment of said plow units for turning said steering wheel with respect to said frame sections, said linkage means turning said steering wheel with respect to said frame sections only in response to the width adjustment of said plow units and independent of the turning of said vehicle and said linkage means further maintaining said steering wheel in fixed position with respect to said frame sections for a given adjusted setting of said units independent of the turning of said vehicle.

4,036,307
PLOUGH SHARE WITH REINFORCEMENT PLATE COVERING TONGUE HOLES THEREIN

Sarel Johannes Marais, Lang St., Moorreesburg, Cape Province, South Africa

Filed Apr. 14, 1976, Ser. No. 676,999
Int. Cl.[2] A01B *15/06*
U.S. Cl. 172—749 7 Claims

1. A plough share made of metal plate, the share having a straight cutting edge, a convex inner curved side and a substantially parallel convey outer curved part, and thickened outer part adjacent the outer curved part which converges toward the straight cutting edge, the share further including at least two spaced tongues pressed out of the metal plate from the convex inner curved side to the outer curved part and thereby forming holes in the metal plate, the tongues projecting on the outer curved part rearwardly and being adapted to engage in complementary holes formed in the frog of the plough, and a reinforcement plate attached to the plough share on the convex inner part thereof opposite to the side to which the frog is

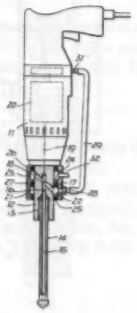


to be attached and, wherein the reinforcement plate covers the holes formed by the pressed out tongues.

4,036,308
APPARATUS FOR REMOVING THE DRILLINGS FROM THE DRILLING SITE OF A DRILL

Hugo Dellenberg, Moordeich, Germany, assignor to Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung, Uphusen, Germany

Filed Apr. 7, 1975, Ser. No. 565,568
Claims priority, application Germany, Apr. 9, 1974, 2417228
Int. Cl.[2] E21C *7/02*
U.S. Cl. 173—75 13 Claims



1. An apparatus for removing the drillings from a drilling site of a drill of a drilling machine provided with a housing, a chuck and a motor for driving said drill which is inserted into the cavity of the chuck, said apparatus comprising:

a. a suction conduit having an open end at said drilling site and a closed end spaced therefrom, said conduit extending in the direction of the rotational axis of said drill for sucking in drillings from the drilling site toward said closed end;

b. a wall having a cylindrical outer surface, said wall surrounding said closed end of said suction conduit and a portion of said suction conduit adjacent to said closed end, said cylindrical outer surface having first and second axially spaced holes formed on opposed sides thereof, and first and second cross conduits connecting said first and second holes respectively to said portion of said suction conduit, said first and second cross conduits meeting at said suction conduit to form a continuous passage through

said wall for conveying a compressed air stream from said first hole to said second hole across said suction conduit;

c. a connecting ring surrounding said cylindrical wall surface and forming an inner air supply annulus closed by said cylindrical wall surface;

d. a compressed air source and a connecting piece on said connecting ring for connecting said air supply annulus to said compressed air source; and

e. said connecting ring being adapted for non-rotating connection to said housing in such a position that said first axial hole opens into said inner air supply annulus, and said first cross conduit connects said inner air supply annulus with said suction conduit, and said second axial hole opens into an area outside said inner air supply annulus, and said second cross conduit connects said suction conduit with said second axial hole to remove the drillings from said portion of said suction conduit by said compressed air passing through said first and second cross conduits and across said suction conduit.

4,036,309

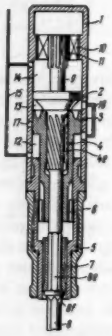
DOUBLE-PISTON ROCK DRILL

Anatoly Mikhailovich Petreev, ulitsa Sibiryakov-Gvardeitsev, 8, kv. 59; Anatoly Alexeevich Lipin, ulitsa Vatutina, 17, kv. 9; Vladimir Davydovich Rabko, Krasny prospekt, 186, kv. 60; Gennady Ilich Suxov, ulitsa Sovetskaya, 47, kv. 22, all of Novosibirsk; Vladimir Ivanovich Kunegin, ulitsa Dzerzhinskogo, 3, kv. 17, and Alexandr Safronovich Kurdjukov, ulitsa Karla Libknekhta, 113, kv. 26, both of Kyshtym Chelyabinskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 584,930, June 9, 1975, abandoned. This application Mar. 4, 1976, Ser. No. 664,000

Int. Cl.² B25D *9/06*

U.S. Cl. 173—103 **5 Claims**



1. A double-piston rock drill with a rotary drive of a drill steel including an overrunning clutch and a screw pair comprising a housing accomodating: pistons each having a head and a rod, said pistons dividing the inner space of said housing into chambers and one of said pistons having an appropriately arranged outer helical thread and the other said piston having an inner helical thread, said threads forming said screw pair, at least one of said pistons being adapted to strike against the shank of said drill steel; said overrunning clutch forming; together with said screw pair, rotary drive of said drill steel; an air distribution system for admitting compressed air to said chamber and for discharging exhaust air into atmosphere; a rotable chuck for receiving the shank of said drill steel arranged in the front portion of said housing; one of said pistons being in force transmitting connection with said rotary drive of said drill steel and cooperating, during the drilling, with said rotatable chuck of the drill steel, and the other of said pistons being kinematically connected with the rock drill housing so as to avoid their relative rotation at least in one direction.

4,036,310

LINING FOR A PILE DRIVING HEAD AND METHOD AND TOOL FOR THE REMOVAL OF SAID LINING

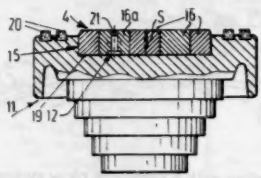
Hans Günther Schnell, Hamburg, Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Filed June 16, 1975, Ser. No. 587,152

Claims priority, application Netherlands, June 26, 1974, 7408633

Int. Cl.² E02D *7/02*

U.S. Cl. 173—131 **11 Claims**



1. For use in a pile driver including a driving head having an upwardly opening chamber formed therein,

a lining in said chamber including,

a plurality of coplanar lining elements in side by side relation in said chamber of the driving head, an armature positioned in said chamber adjacent at least one of said lining elements and being removable from said chamber, said armature having interengaging means extending axially therealong in the direction of said lining elements for interengagement with a removing tool adapted to remove said armature thereby to leave a space in the chamber adjacent said at least one lining element to accommodate ready removal of said lining elements.

4,036,311

ROD SHAPED HAND-TOOL

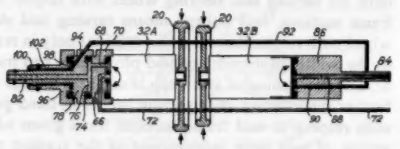
Sven Karl Lennart Goof, Gammel Strandvej 236A, Humlebaek, Denmark

Filed Mar. 7, 1975, Ser. No. 556,448

Claims priority, application Denmark, Mar. 12, 1974, 1334/74

Int. Cl.² B23B *45/04*

U.S. Cl. 173—169 **19 Claims**



1. A rod-shaped handpiece, such as a dental syringe, a drilling instrument, or the like manually operable or controllable handpieces, the handpiece comprising: a rod-shaped handle portion in the form of a casing having a longitudinal axis; an annular actuating member positioned in said handle portion, having energy supplying means, energy removing means, actuatable means and a casing for enclosing the actuatable means; a return member associating with said actuating member; said actuating member, by a manual press, being movable from a central position to an outer position, from which outer position it is moved back to the central position by said return member when the press has ceased; said actuating member being comprised of at least one ring (**20**) movable between said positions substantially perpendicularly to said longitudinal axis (**22**) of the casing, the ring having an axis, a thickness in a direction parallel to its axis, and an external dimension perpendicular to its axis; wherein said external dimension of said ring is larger than the thickness thereof, the axis of said ring, when in said central position, being parallel to said longitudinal axis of the casing, and said external dimension being at least flush with the surface of said casing (**12**) when said actuating mem-

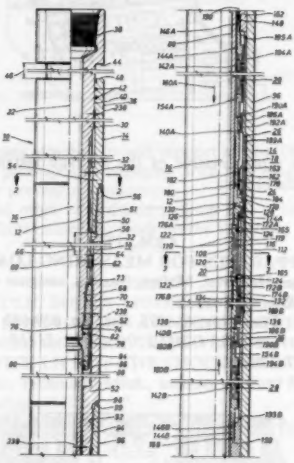
ber is in its central position; and wherein the axis of said ring, when in its outer position, is moved relative to the axis of said casing.

4,036,312

WELL JAR

Kenneth R. DeLuish, Humble, Tex., assignor to HYCALOG Inc., Houston, Tex.

Filed Sept. 13, 1976, Ser. No. 722,495
Int. Cl.² E21B 1/10
U.S. Cl. 175—302 **32 Claims**



1. A well jar comprising:

first and second telescoped members each having an impact surface, said second member engageable to a device susceptible of being stuck,

a resilient member associated with said first member and compressible only in response to a force on said first member exceeding a predetermined magnitude,

latching means having an extending portion coupled with said resilient member for releasably preventing displacement of said first member relative said second member,

biasing means for biasing said latching means away from said displacement preventing relationship,

release means having an opening sized to receive said extending portion and rotatable relative said first member for releasing said latching means, and,

means for transmitting forces imposed on said first member to said release means,

said resilient member being compressible to impose a force through said transmission means to said release means, said release means being rotatable to register said opening therein with said extending portion, said latching means being radially displaceable responsive to said biasing means to simultaneously engage said extending portion within said opening and to release said first member, said first member being axially displaceable to drive said surfaces into impact-producing contact.

4,036,313

MOUNTING FOR INBOARD CUTTERS ON A RAISE DRILL

Robert L. Dixon, Brea, and Malcolm D. Maxsted, Harbor City, both of Calif., assignors to Smith International, Inc., Irvine, Calif.

Filed July 3, 1975, Ser. No. 593,036
Int. Cl.² E21B 9/24
U.S. Cl. 175—344 **19 Claims**

1. A raise drill comprising:

a drive stem adapted to be connected to a rotating drill string,

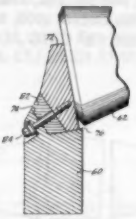
a cutter mounting frame secured to the drive stem and projecting radially therefrom,

a cutter assembly including a shaft and a rotary cutter journaled for rotation on the shaft, the shaft projecting beyond the ends of the cutter, the stem having a bore for receiving one end of the cutter shaft,

a yoke member receiving the other end of the shaft,

means securing the shaft end to the yoke member,

means for mounting the yoke member to the cutter mounting frame including a mounting member secured to the frame, the mounting member having first and second



intersecting planar surfaces, the first surface extending substantially parallel to the axis of said bore, and the second surface extending at an obtuse angle to the first surface and facing the stem, the yoke member having a first surface substantially parallel to the axis of rotation of the cutter adapted to slidably engage the first surface of the mounting member, and a second surface spaced from the second surface of the mounting member and parallel thereto,

a spacer inserted between said second surfaces, and

means extending between the yoke member and mounting member for clamping the spacer between said second surfaces.

4,036,314

HOLE OPENER WITH IMPROVED ROTARY CUTTER MOUNTING

Robert L. Dixon, Brea, and Robert E. Allison, Whittier, both of Calif., assignors to Smith International, Inc., Irvine, Calif.

Filed June 28, 1976, Ser. No. 700,313
Int. Cl.² E21B 9/08
U.S. Cl. 175—364 **12 Claims**

1. An earth boring drill apparatus comprising a drive stem, a cutter mounting leg secured to the stem, a removable cutter assembly including a shaft and a rock boring cutter mounted for rotation on the shaft, a bore in a side of the stem for slidably receiving the inner end of the shaft; the cutter mounting leg having a shaft supporting portion spaced apart from and extending substantially parallel to the stem for supporting the outer end of the cutter shaft; a support engaging lug on the outer end of the cutter shaft, the shaft supporting portion of the

mounting leg and the support engaging lug having mating surfaces extending parallel to the axis of the shaft for maintaining axial alignment of the shaft and the bore and preventing rotation of the shaft, the shaft being movable in an axial direction between the stem and the mounting leg with the mating surfaces in contact by an amount sufficient to permit the shaft to be withdrawn from the bore, and means clamping the opposing surfaces together to secure the outer end of the cutter assembly to the mounting leg.

4,036,315

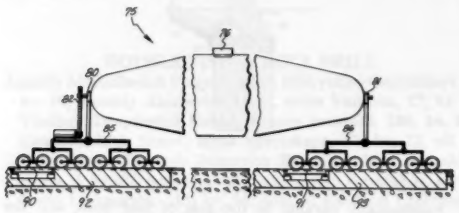
WEIGHING SYSTEM

Rune Flinth, and Nordstrom Kjell, both of Vasteras, Sweden, assignors to Transcale AB, Vasteras, Sweden

Continuation of Ser. No. 587,112, June 16, 1975, abandoned. This application Oct. 6, 1976, Ser. No. 730,074

Int. Cl.[2] G01G *19/04*

U.S. Cl. 177—1 **9 Claims**



1. A method of weighing a vehicle containing a body of liquid where the center of gravity of the body of liquid may shift in an uncontrollable manner within the vehicle and which vehicle has a first group of axles at the forward end thereof and a second group of axles at the rearward end thereof with each axle having at least two wheels thereon and wherein the axles of each group are symmetrically spaced about a center through which the load is applied to the axle group, said weighing method including the steps of locating the wheels of a known fraction of the axles of the first group of axles on a first weighing platform, locating the wheels of a known fraction of the axles of said second group of axles on a second weighing platform, sensing the weight of said wheels on said first and second platforms, and providing an indication of the entire weight of said vehicle based upon said sensed weight and said known fractions.

4,036,316

COMPUTING SCALE AND METHOD WITH TARING CAPABILITY

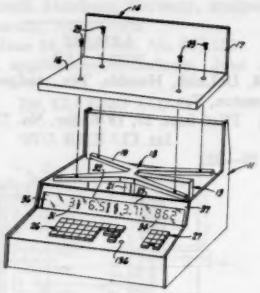
Frank C. Rock, Santa Rosa, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Division of Ser. No. 510,467, Sept. 30, 1974, Pat. No. 3,951,221. This application Dec. 19, 1975, Ser. No. 642,482

Int. Cl.[2] G01G *23/22, 13/14*

U.S. Cl. 177—1 **9 Claims**

1. In a method for determining the weight of an object, the steps of: providing an electrical signal corresponding to the weight of the object, converting the electrical signal to digital signals representative of the instantaneous weight of the load at a predetermined clock rate, storing a plurality of the instantaneous weight signals on a rotating basis whereby the oldest of the stored signals is replaced by the instantaneous weight signal provided during each successive clock period, determining the average of the stored signals to provide a continuously updated signal representative of the average instantaneous weight of the load, storing a signal corresponding to the average instantaneous weight at a predetermined time, and combining the stored signal with subsequent signals representative of the average weight of the load to effect subtraction of the weight represented by the stored signal from the weight represented by each of the subsequent signals and provide successive signals representative of the average instantaneous net weight of the object.



4,036,317

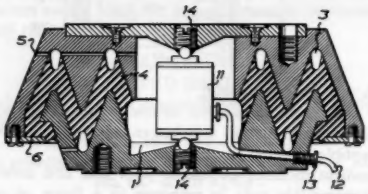
APPARATUS FOR MEASURING LOADS

John William Hellkvist, Malmo, Sweden, assignor to AB Stathmos, Jonkoping, Sweden

Filed Nov. 6, 1975, Ser. No. 629,683

Int. Cl.[2] G01G *5/04, 19/08, 21/10*

U.S. Cl. 177—209 **6 Claims**



1. An apparatus for measuring loads with the use of a plurality of measuring points, said measuring points consisting of one load-supporting measuring element being placed at each measuring point, wherein each measuring element comprises an upper fastening element, a lower fastening element and means interjacent thereto for taking up lateral forces acting upon the measuring element, said means comprises a ring of resilient material whereby a central space is provided therein for accommodating a pressure medium consisting of a transducer or a volume of measuring liquid.

4,036,318

SHOP SCALES WITH DIGITAL WEIGHT INDICATION

Jarl Nyholm, Vespertie 6, 00320 Helsinki 32, Finland

Filed May 16, 1975, Ser. No. 578,096

Claims priority, application Finland, May 21, 1974, 741557

Int. Cl.[2] G01G *3/14*

U.S. Cl. 177—211 **5 Claims**

1. A shop scale for digital indication of weight, comprising:

a. a balance lever;

b. a support means;

c. a first pair of knife edges carrying the balance lever on the support means;

d. a second pair of knife edges on the balance lever;

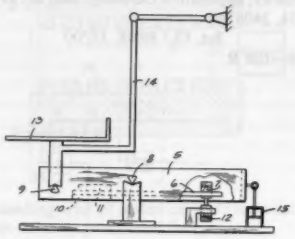
e. a weighing platform acting on the second knife edges to deflect the balance lever;

f. a transverse plate attached to said balance lever;

g. a pick-up arm having a planar surface with strain gauge

means mounted thereon for measuring bending of the pick-up arm;

h. one end of the pick-up arm being rigidly attached to said transverse plate;



i. stop means attached to said support means, the other end of said pick-up arm engaging with said stop means and thereby preventing deflection;

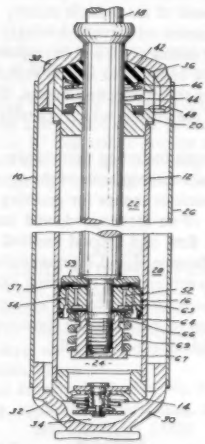
whereby said other end of said pick-up arm is isolated from torsional effects caused by loads on the weighing platform.

4,036,319

HYDRAULIC SHOCK ABSORBER FOR A MOTOR VEHICLE HAVING FLOW CONTROL VALVING THAT BECOMES MORE RESTRICTIVE DURING THE SERVICE LIFE OF THE SHOCK ABSORBER

Lee R. Andre, Tecumseh, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1975, Ser. No. 631,252
Int. Cl.[2] F16F *9/50*
U.S. Cl. 188—282 **3 Claims**



1. A hydraulic shock absorber constructed to become stiffer during usage having first and second fluid chambers and flow control means constructed to provide a restictive fluid passage for the controlled flow of hydraulic fluid from said first chamber to said second chamber;

said flow control means including a fluid passage, a valve seat positioned about one end of said passage and a valve element;

spring means exerting a cumulative spring force upon said valve element urging said valve element into seated engagement with said valve seat;

said spring means comprising a primary spring exerting a spring force urging said valve element toward said seated position and a secondary spring exerting a spring force tending to counter the force of said primary spring on said valve element;

said secondary spring having a service life substantially less than the service of said primary spring whereby the cumulative force of said primary spring and said secondary spring increases during the service life of said shock absorber;

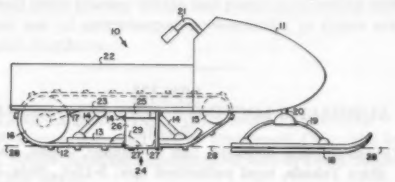
said secondary spring comprising a Belleville spring having an annular fatigue groove constructed to cause said spring force exerted by said secondary spring to be substantially reduced during repeated flexing of said secondary spring.

4,036,320

LUBRICATION DEVICE FOR SNOWMOBILE SLIDERAIL

Kenneth R. Rabehl, Beaver Dam, Wis., assignor to James T. Murray, Beaver Dam, Wis., a part interest

Filed Feb. 12, 1975, Ser. No. 549,456
Int. Cl.[2] B62D *55/00*
U.S. Cl. 180—5 R **7 Claims**



1. In a vehicle comprising an endless belt support means for supporting and driving the vehicle on ice and snow surfaces and comprising slide rail means slidingly engaged with portions of said belt means to support the body of said vehicle from said belt means, the combination with said vehicle of:

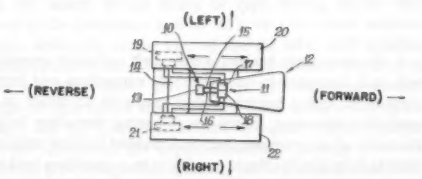
means attached to portions of the body of said vehicle to engage a portion of said surfaces alongside said belt means and said slide rail means and deflect said portion of said surfaces into engagement with said slide rail means and said belt means engaged by said slide rail means.

4,036,321

SINGLE LEVER STEERING CONTROL FOR HYDRAULIC DRIVE VEHICLES

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1976, Ser. No. 663,595
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **19 Claims**



1. For use with a vehicle having opposite sides, a left side driving means having first speed control means, and a right side driving means having second speed control means, improved control means for selectively controlling the operation of said speed control means of said driving means to effect a selective steering drive of the vehicle comprising: a manually operable control lever; mounting means for mounting the control lever for pivotal movement about a transverse first axis; a first operating lever movable with said control lever about said axis; first connecting means connecting said first operating lever to said second speed control means for causing

selective variable speed forward and rearward operation of said right side driving means; a second operating lever movable with said control lever about said axis; second connecting means for connecting said second operating lever to said first speed control means for causing selective variable speed forward and rearward operation of said left side driving means; and positioning means movable with said control lever for selectively movably engaging either of said operating levers to adjustably change the disposition of said operating levers relative to each other in parallel planes parallel to said axis as a result of movement of the control lever parallel to said axis to effect differential adjustment of said first and second connecting means and thereby differential operation of the right and left side driving means for causing a desired steering of the vehicle, movement of said control lever and operating levers about said first axis causing concurrent adjustment of said first and second connecting means selectively concurrently with or independently of said differential adjustment.

4,036,322

AUTOMATIC LOCKING SAFETY BELT RETRACTOR REEL

Takezo Takada, deceased, late of Hikone, Japan, and by Juichiro Takada, legal authorized heir, 3-12-1,, Shin, Setagaya, Tokyo, Japan

Continuation-in-part of Ser. No. 462,678, April 19, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,169

Claims priority, application Japan, Apr. 25, 1973, 48-046136

Int. Cl.[2] A62B *35/02*; B65H *75/48*

U.S. Cl. 180—82 C **7 Claims**

1. An automatic braking safety belt retractor comprising a belt reel rotatable in opposite belt extraction and retraction directions, spring means urging said reel to rotate in a belt retraction direction, means for fastening the safety belt about the body of an occupant, inertia activated braking means transferable from a reel release condition to a condition braking said reel against rotation in a belt extraction direction in response to a function of the rotational speed of said reel exceeding a predetermined value, switch-actuated electromagnetic means for retaining said braking means in said reel release condition in response to the energization of said electromagnetic means prior to engagement of said safety belt fastening means regardless of the value of said function, means responsive to the occupation of a vehicle seat associated with said retractor for energizing said eletromagnetic means, a buckle carried by the belt wound on said reel and means responsive to the coupling engagement of said buckle for deenergizing said eletromagnetic means and deactuating said retaining means independently of the occupation of said seat.

4,036,323

VEHICLE CONTROL APPARATUS

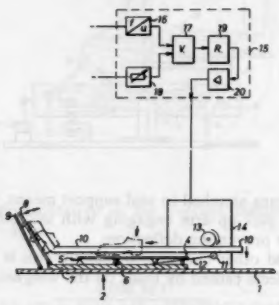
Karl-Heinz Schmall, Moncalleristrasse 5, D-757 Baden-Baden, Germany

Filed Jan. 17, 1975, Ser. No. 542,056

Claims priority, application Germany, Jan. 25, 1974, 2403586; Feb. 23, 1974, 2408764

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—105 R **28 Claims**



1. An apparatus for automatically regulating the speed of a motor driven vehicle comprising:

an actuating member separate from, and adapted to be placed in the vehicle rearward of, the vehicle accelerator pedal and movable from a raised inactive position to a lowered actuating position under the action of the driver's foot, and means for moving the actuating member back to its raised inactive position when not being urged to said lowered actuating position,

connecting means connectable to a part of the vehicle which controls the speed of the vehicle motor,

a speed control means selectively drivingly engagable with the connecting means upon and in response to movement of the actuating member to said lowered actuating position for moving the connecting means, to in turn operate the said part of the vehicle which controls the speed of the vehicle,

and a control circuit including first emitter means for emitting a first signal representative of the actual vehicle speed and a second emitter means for emitting a second signal representative of an ideal speed, and control means for receiving said first and second emitted signals and for emitting a difference signal representative of the difference therebetween and for operating said speed control means in response to and by an amount related to the difference signal to in turn move the connecting means in response to said difference signal.

4,036,324

NOISE REDUCTION

Colin Washbourne, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed July 30, 1975, Ser. No. 600,474

Claims priority, application United Kingdom, Aug. 16, 1974, 36234/74

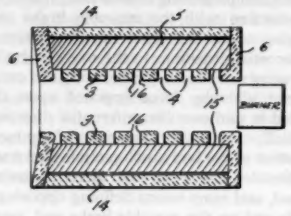
Int. Cl.[2] F01N *1/04, 7/18, 3/06*

U.S. Cl. 181—42 **3 Claims**

1. A fluid fuel burner assembly comprising a burner, and

a burner quarl consisting essentially of a substantially non-porous ceramic material tube having substantially radial vents along its length, the ceramic material tube being surrounded along at least part of its length by at least one sound absorbing chamber, and

wherein the outside of the sound absorbing chamber comprises a surrounding wall of sealed ceramic material connected to the ceramic tube by two radial flanges.

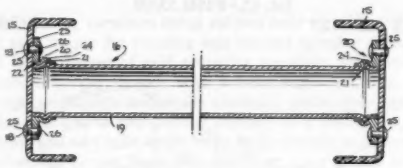


4,036,325

RUNG ASSEMBLY FOR A LADDER AND A METHOD OF MAKING THE RUNG ASSEMBLY

George Robert Ruff, Newberry, and Danny O'Brian Derrick, Columbia, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed June 30, 1975, Ser. No. 591,957
Int. Cl.[2] E06C 7/50
U.S. Cl. 182—46 11 Claims



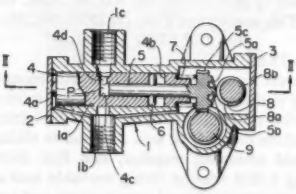
1. A rung assembly for a ladder comprising:
a rung having at least one deformed end and a bead within said end; and
a flanged fitting mounted on said end of said rung, said fitting having a deformed collar portion, a bead disposed intermediately of said collar portion and in interlocking relation with said bead on said rung and an outwardly directed flange for securing said assembly to a ladder siderail.

4,036,326

LUBRICATING OIL PUMP

Osamu Mukai; Akira Miyatani, both of Yokohama; Kokichi Fukuzawa, Yamato; Yoshiro Nagao, Chigasaki; Kenichi Kubota, Tokyo; Masakuni Shibuya, Tokyo, and Shigelu Kobayashi, Tokyo, all of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Japan

Filed July 30, 1975, Ser. No. 600,486
Claims priority, application Japan, Aug. 2, 1974, 49-92604
Int. Cl.[2] F16N 13/04
U.S. Cl. 184—27 R 8 Claims



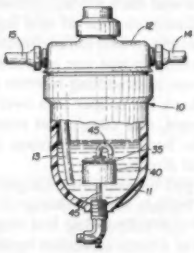
1. A lubricating oil pump comprising a pump body having a cylinder chamber, suction port and at least one delivery port, a distributor rotatably fitted in said cylinder chamber and having a blind hole in the inside thereof, a plunger slidably fitted in said blind hole and having a cam on the outer end face thereof, said plunger being rotated in rotational direction integrally with said distributor about their common axis but being capable of performing relative movement in thrust direction in respect to said distributor, a cylindrical guide-column member provided to said pump body and engageable with said cam, said cylindrical guide-column member thus making said plunger perform reciprocating movement in thrust direction with respect to said distributor when said plunger is rotated, a spring applied between said distributor and plunger and biasing said plunger so that said cam is pushed against said cylindrical guide-column member, and said distributor is pushed against said pump body to prevent relative movement in thrust direction between said distributor and pump body, a pump chamber formed in said blind hole and between said distributor and plunger and communicatable with said suction port and delivery port and drive gearing within said pump cooperating with gearing on one of said plunger or distributor to rotate said plunger and distributor.

4,036,327

AIR LINE LUBRICATOR WITH SAFETY DEVICE

Robert M. Moore, deceased, late of Englewood, Colo., and by Bette J. Moore, personal representative, 4695 S. Jason, Englewood, Colo. 80110

Filed Jan. 8, 1976, Ser. No. 647,344
Int. Cl.[2] F01M 1/08; F16N 7/32
U.S. Cl. 184—55 A 7 Claims



1. An improved air line lubricator safety device for use in a lubricator having an oil bowl containing oil and pressurized air and means feeding oil to an air line leading to an air operated device, the safety device being of type having an air tube mounted in the lubricator and an oil level controlled member moveable relatively to the end of the air tube, said member being supported by the oil to seal the air tube when the oil level is above a predetermined level and the air tube being opened when the oil falls below said predetermined level, allowing air to escape the oil bowl and actuate a signal device located outside the lubricator, the improvement comprising:
a. said oil level controlled member having a tiltable member mounted on its upper side for sealingly contacting the air tube when the oil level is above said predetermined level, and for tilting with respect to the upper side of the oil level controlled member to progressively open the air tube as the oil falls below said predetermined level; and
b. said air tube having a relatively small orifice sealingly contacted by said tiltable member and having a relatively larger interior bore, the small orifice providing superior sealing against air and oil leaks under conditions of vibrations and pressurized atmosphere within the lubricator, and said relatively larger interior bore of tube preventing the air tube from becoming clogged with particles of heavy oil from the lubricator bowl.

4,036,328

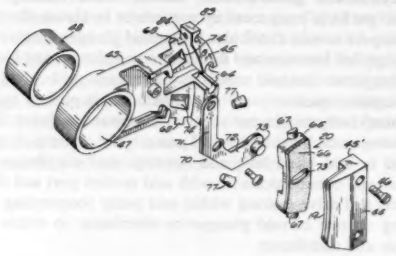
DISC BRAKE APPARATUS SUITABLE FOR BICYCLES

Neil R. Hoffman, Mequon, and Johannes H. Jansen, Milwaukee, both of Wis., assignors to Brake Engineering, Inc., Milwaukee, Wis.

Division of Ser. No. 606,711, Aug. 21, 1975, Pat. No. 3,985,391. This application May 5, 1976, Ser. No. 683,484

Int. Cl.[2] F16D *55/16*

U.S. Cl. 188—26 **9 Claims**



1. A caliper brake assembly for a bicycle wheel or the like that is rotatably mounted on relatively fixed structure and normally rotates only in one direction, said assembly being cooperable with a disc-like rotor that has axially opposite flat faces and is constrained to concentric rotation with the wheel, said assembly comprising:

A. a body having a connecting portion and a pair of opposing caliper legs that project in one radial direction from said connecting portion, said legs being spaced apart in axial directions and each having substantial extent in circumferential directions, one of said legs having substantially greater extent in said radial direction than the other;

B. attachment means on said one leg for securing said body to fixed structure in straddling relation to an edge portion of a rotor to have the caliper legs overlying the opposite faces of the rotor, said attachment means being arranged to confine the body against motion in said radial and circumferential directions;

C. a first brake pad on said other caliper leg having a substantially flat friction surface facing in the axial direction towards said one caliper leg and engageable with the adjacent face of a rotor straddled by the body;

D. a movable brake pad carried on said one caliper leg, having a substantially flat friction surface that faces the friction surface on said first brake pad and is engageable with the opposite face of a rotor straddled by the body;

E. cooperating means on said one caliper leg and on the movable brake pad confining the latter against motion relative to the body in radial directions and other than substantially translatory motion in other directions, said cooperating means comprising

1. a lug on the movable brake pad at each of the circumferentially opposite ends thereof, each of said lugs projecting outwardly in a circumferential direction from its circumferential end of the brake pad,

2. a pair of lugs on said one caliper leg, one for each of said lugs on the movable brake pad, said lugs on said one caliper leg projecting in said circumferential directions from the circumferentially opposite sides of said one caliper leg and each opposing its lug on the movable brake pad and being adjacent thereto; and

3. a pair of coiled garter springs, one embracing each of said lugs on the movable brake pad and the adjacent lug on said one caliper leg and thereby urging the movable brake pad in the axial direction away from the first brake pad;

F. a bell crank overlying said one caliper leg and pivoted thereto to swing about a fulcrum axis which extends in said axial directions, said bell crank having

1. one arm projecting in one of said circumferential directions beyond said one caliper leg and

2. another arm projecting substantially radially and having a connection with the movable brake pad whereby swinging of the bell crank imparts motion in said circumferential directions to the movable brake pad;

G. cooperating ramp means on the body and on the movable brake pad whereby force imposed upon the movable brake pad in said one circumferential direction produces substantially translatory movement of the movable brake pad relative to the body, obliquely in said one circumferential direction and in the axial direction towards the first brake pad, said ramp means defining opposing surfaces on the body and on the movable brake pad, respectively, at least one of said surfaces being inclined axially and circumferentially to the friction surface of the movable brake pad; and

H. biasing means reacting between the body and said bell crank to urge the latter to swing in the direction that carries the movable brake pad in the opposite circumferential direction.

4,036,329

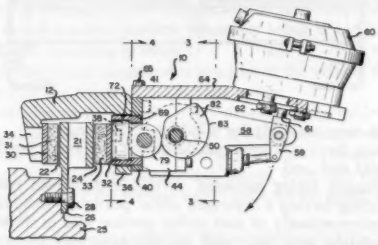
DISC BRAKE WITH ROTARY CAM ACTUATED RECIPROCATING PISTONS

Bruce D. Anderson, Berkley, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1975, Ser. No. 631,097

Int. Cl.[2] F16D *55/08*

U.S. Cl. 188—72.7 **5 Claims**



4. An actuator for a disc brake comprising a caliper including a web and a pair of spaced depending legs, a pair of apertures open through one of said legs, a piston slidably mounted in each of said apertures, roller means rotatably mounted to each of said pistons, a shaft rotatably mounted to said caliper, and a spaced pair of cams mounted for rotation with said shaft, each of said cams including an outer surface of increasing radial dimension aligned with an annular surface of one of said roller means.

4,036,330

DISC BRAKE

Dale A. Henning, and Jack D. Rainbolt, both of Troy, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

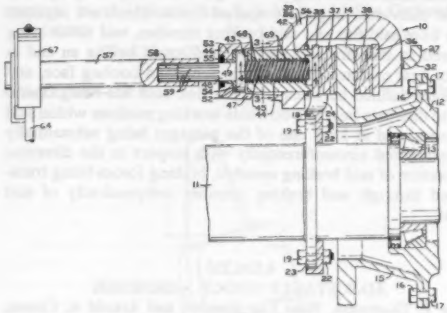
Continuation-in-part of Ser. No. 533,947, Dec. 18, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,179

Int. Cl.[2] F16D *55/224*

U.S. Cl. 188—72.8 **10 Claims**

1. A disc brake comprising a nonrotatable mounting member, a housing in sliding engagement with said mounting member, a brake disc rotatable about an axis, a first friction lining carrier located on one side of said disc and in sliding engagement with said mounting member, said first friction lining carrier having a first friction lining movable into and out of clamping engagement with said disc, a screw and nut assembly including two actuating members in threaded engagement, one of said actuating members being in force-transmitting engage-

ment with said housing in the axial direction relative to said disc and the other of said actuating members being in force-transmitting engagement with said friction lining carrier in the axial direction relative to said disc, means to hold a first member of said actuating members against rotation relative to said mounting member and means to apply torque and rotate a second member of said actuating members relative to said first member in one direction to generate an axial force urging said first member axially relative to said mounting member to apply a brake clamping force on said brake disc with the resultant torque forces from rotation of said disc being transmitted from said friction lining carrier directly to said mounting member,



said actuating members being subject only to said axial force and said torque for rotating said second member relative to said first member of said actuating members, said actuating members having threads with a helix angle which is small enough to provide said brake clamping force upon applying braking torque to said second member in a first direction of rotation and said helix angle being large enough to generate an overhauling torque from said clamping force which is sufficient by itself to rotate said second member in a second direction opposite to said first direction upon release of said braking torque whereby said brake clamping force is released without the application of additional force to rotate said second member in said second direction.

4,036,331

VEHICLE ANTI-SKID BRAKE CONTROL APPARATUS

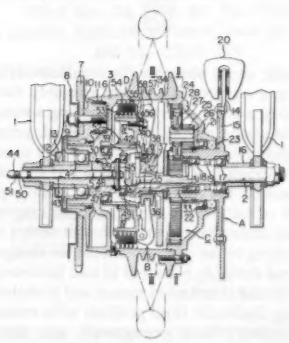
Tsutomu Hayashi, Hoya; Takeshi Kawaguchi, Fujimi, and Noriyuki Maeda, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1976, Ser. No. 690,040

Claims priority, application Japan, May 31, 1975, 50-65605

Int. Cl.[2] B60T *8/04*

U.S. Cl. 188—187 **12 Claims**



1. A vehicle anti-skid brake control apparatus comprising:

first brake means for directly receiving a mechanical brake force for primarily absorbing the travelling energy of a vehicle, and

second brake means operable, upon application to said first brake means of a brake force in excess of a critical level determined by the travelling speed of the vehicle, for cutting off a mechanical circuit for transmitting the brake force from said first brake means to an associated road wheel of the vehicle and thereafter to secondarily absorb the rest of the vehicle travelling energy not absorbed by said first brake means.

4,036,332

SLACK ADJUSTER BUILT INTO A BRAKE UNIT FOR A RAIL VEHICLE BRAKE SYSTEM

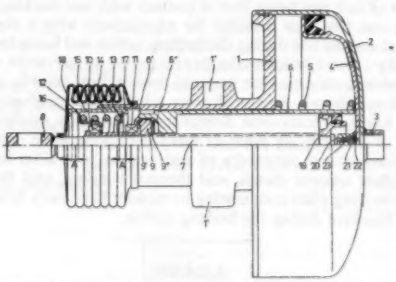
Nils Börje Lennart Sander, Malmö, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed June 24, 1976, Ser. No. 699,387

Claims priority, application Sweden, July 14, 1975, 7508016

Int. Cl.[2] F16D *65/66;* **B61H** *15/00*

U.S. Cl. 188—196 D **14 Claims**



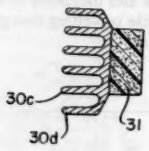
1. A slack adjusting brake unit mechanism for railway brake systems comprising in combination, a piston, a tube member attached to said piston and axially movable with said piston, an axially movable non-rotatable threaded spindle adapted for connection to the braking system coaxially positioned within said tube, a nut in non-self-locking thread engagement with said spindle having two opposed clutch surfaces axially displaced by the nut a first predetermined distance, a set of two clutch surfaces on said tube disposed for respectively mating with said clutch surfaces on said nut in different axial positions of said nut and spaced at an axial distance greater than said first predetermined distance thereby to transmit force from said piston to said spindle, two spaced shoulders on said nut, a fore control member and a rear control member both axially movable spaced between said two shoulders and adapted to engage them to limit axial movement of each respective control member in a corresponding direction, a spring between said control members urging them apart toward engagement with said shoulders, a housing, limit means affixed to said housing at two spaced positions limiting movement of said control members axially over a predetermined slack adjustment distance between said shoulders whereby contact of either said control member with a respective one of said limit means to move such away from one of said shoulders causes axial motion of said spindle to move said nut from a position with one opposed clutch surface thereon non-rotatably engaged with a corresponding mating clutch surface on said tube to an opposed axial position with the opposite clutch surfaces non-rotatably engaged passing through an intermediate position wherein the nut will rotate on said spindle with axial motion of the spindle.

4,036,333

BICYCLE BRAKE SHOE WITH HEAT DISSIPATING MEANS

William R. Mathauser, P.O. Box 5, Sun Valley, Idaho 83353

Filed Feb. 13, 1976, Ser. No. 657,931
Int. Cl.[2] F16D 65/807
U.S. Cl. 188—264 A 8 Claims



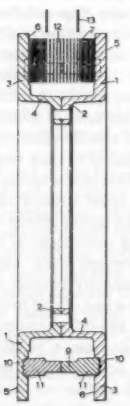
1. A brake means comprising a brake shoe which includes a backing plate having a flat central portion with a plurality of cooling fins on one side thereof and integral extension portions extending outwardly from opposite edges of said central portion and being angled toward said one side for dissipating heat generated in the brake shoe by a braking action to the atmosphere, an elongate parallelepiped pad of friction material having only one face bonded on the other side of the shoe backing plate in thermal contact therewith, all of the other faces of said pad being free of contact with said backing plate with one free face oriented for engagement with a rim of a wheel and the like during the braking action and being longitudinally curved to approximate the radius of curvature of the wheel rim, said friction material having heat transfer means dispersed therein for transferring heat therethrough and said pad having a transverse dimension substantially smaller than that of said backing plate so that the backing plate extension portions extend outwardly of said pad on both sides thereof, said heat transfer means, said thermal bonding, said fins and said backing plate cooperating to transfer heat away from said one free face during the braking action.

4,036,334

BRAKING MEMBER HAVING A PLURALITY OF COATING FINS

Peter William Brown, West Midlands, England, assignor to Girling Limited, Birmingham, England

Filed Mar. 30, 1976, Ser. No. 671,992
Claims priority, application United Kingdom, Apr. 8, 1975, 14276/75
Int. Cl.[2] F16D 65/807, 65/827, 65/847
U.S. Cl. 188—264 A 24 Claims



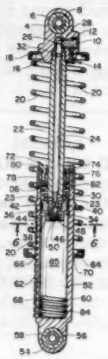
1. A rotatable braking member for a vehicle brake, the braking member having a braking surface for engagement by a non-rotatable friction member, and a cooling face spaced from and in direct heat transfer relationship with said braking surface, a plurality of spaced cooling fins separate from said braking member and arranged adjacent to said cooling face in a relatively spaced relationship, said cooling fins having a co-efficient of thermal conductivity higher than that of the braking member, and heat conducting mounting means for securing said fins to said braking member and for maintaining said fins in said relatively spaced relationship, said heat conducting mounting means having a co-efficient of thermal conductivity higher than that of the braking member and providing a heat transfer connection between all said fins and said cooling face, and said heat conducting mounting means comprising a plurality of individual angularly spaced struts which are separate both from said fins and said braking member, said struts being secured to said fins and each of said struts having an end in direct heat exchange relationship with said cooling face, and passages defined between adjacent fins, said fins being operative to dissipate heat to a flowable working medium within said passages, and at least one of the passages being substantially uninterrupted circumferentially with respect to the direction of rotation of said braking member, braking forces being transmitted through said braking member independently of said struts.

4,036,335

ADJUSTABLE SHOCK ABSORBER

John T. Thompson, West Los Angeles, and Arnold A. Cowan, Encino, both of Calif., assignors to Arnold A. Cowan, Encino, Calif.

Continuation of Ser. No. 457,059, April 1, 1974, abandoned, which is a division of Ser. No. 379,612, July 16, 1973, Pat. No. 3,848,710, which is a continuation of Ser. No. 179,752, Sept. 13, 1971, abandoned. This application Aug. 8, 1975, Ser. No. 602,996
Int. Cl.[2] F16F 9/44
U.S. Cl. 188—319 9 Claims



1. In a hydraulic shock absorber the combination of: a pressure tube having a reciprocable piston assembly therein, said assembly including a hollow piston rod having a piston on one end thereof, said piston having a central, axial, primary fluid passageway communicating one portion of said pressure tube with the other through said hollow piston rod and said piston, attachment means on the other end of said hollow piston rod for attachement of said shock absorber to an unsprung mass, said attachement means having an axial bore with a transverse bore communicating to the exterior thereof; an elongate adjustable metering rod shiftably mounted in said hollow piston rod and axial bore of said attachment means and movable into and out of restricting hydraulic fluid position with respect to said central, axial, primary fluid passageway, said metering rod having a length at least as long as said hollow piston rod and having one extremity within said attachment means having a recessed portion and the other extremity having a reduced

portion; and externally accessible adjusting means disposed in said transverse bore of said attachment means in operative engagement with said recessed portion of said metering rod to adjust the position of said metering rod to any desired position within the stroke limits of said metering rod for movement of the reduced portion of said metering rod into said central, axial, primary fluid passageway and means located in said transverse bore for locking said adjustment means and therefore said metering rod in each adjusted position.

4,036,336

WHEELED SUITCASE CONVERTIBLE TO LUGGAGE CART

Oscar L. Burtley, Box 4, Rte. 3, Lake Land Hills, Carbondale, Ill. 62901

Filed Mar. 25, 1976, Ser. No. 670,279
Int. Cl.² A45C 5/14
U.S. Cl. 190—18 A **7 Claims**

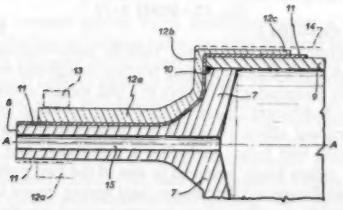
1. In a suitcase having a bottom wall, a top wall and sidewalls, said bottom wall having rolling means and said top wall having a handle, the improvement comprising a retractable handle having a pair of longitudinally extending members connected at their proximal ends to a selected sidewall and connected at their distal ends to a cross-member forming a grip, said longitudinally extending members received in retracted condition within said selected sidewall, said improvement further including recesses in adjoining portions of the selected sidewall and the top wall for cooperative receipt of the longitudinally extending members in retracted condition so that said members are maintained in a plane below the plane of the topwall.

4,036,337

ONE-PIECE CONDUCTOR ROLLER FOR ELECTROLYTIC PROCESSING OF STRIP MATERIALS

Georges Arjalies, La Garde, and Jean-Claude Guillais, Sartrouville, both of France, assignors to Les Traitements de Surface Nobel-Bozel, Gaillonnet-Seraincourt, France

Filed June 24, 1976, Ser. No. 699,636
Claims priority, application France, June 26, 1975, 75.20149
Int. Cl.² C25D 7/04
U.S. Cl. 191—1 A **2 Claims**



1. A roller for the continuous electrolytic processing of metallic or metallized strip materials comprising

a hollow cylindrical body,

two flanges disposed along a common longitudinal axis with and fastened to the respective ends of said cylindrical body,

each said flange comprising end to end along said common longitudinal axis, a cup and a half roller shaft in a single piece, each said flange being fastened to a respective end of said cylindrical body at the periphery of said cup,

inner walls of said cup of said flanges disposed face to face to each other to form inner end walls of the roller,

said flanges being axially transpierced by a longitudinal bore on said inner wall of said cup to convey a cooling fluid to refrigerate the roller,

said body and said flanges having their outer surface covered with a continuous layer of uniform thickness of a corrosion-resistant metal and covered thereon with a continuous layer of a metal of good electrical conductivity having a constant cross section for the passage of an electric current,

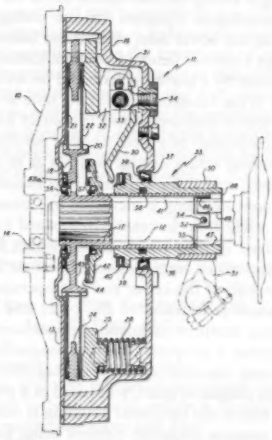
the zone of the face of the roller being provided with an outer coating of a hard metal thereon.

4,036,338

SEALED OIL-FILLED CLUTCH

Donald F. Linn, Manlius; Frederick C. Schmidt, Syracuse, and John P. Yanko, Liverpool, all of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,258
Int. Cl.² F16D 67/02, 13/56
U.S. Cl. 192—13 R **8 Claims**



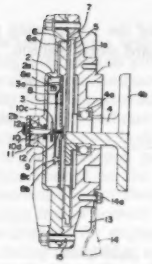
1. A friction clutch for connecting driving and driven shafts comprising an oil-tight enclosure adapted to be secured to the flywheel of an engine for rotation therewith, the enclosure being a two piece assembly having flat flywheel engaging plate and a dished cover member, means within the enclosure for normally effecting a driving connection between the shafts, release levers operable to disengage said driving connection, and means to actuate the release levers including a non-rotatable, axially movable sleeve encircling the driven shaft and extending from outside the oil-tight enclosure into the interior thereof, the actuating means includng at the inner end of the sleeve a thrust bearing engageable with the release levers.

4,036,339

TEMPERATURE SENSITIVELY ACTUATED HYDRAULIC COUPLING FOR DRIVING FANS

Yasubee Kikuchi, Shuzenjimachi, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 12, 1976, Ser. No. 648,134
Claims priority, application Japan, Feb. 4, 1975, 50-014710
Int. Cl.[2] F16D 35/00, 43/25
U.S. Cl. 192—58 B 3 Claims



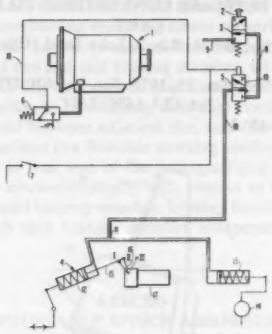
1. Temperature sensitively actuated hydraulic coupling comprising a casing on one side, a cover on the other side, a torque transmission chamber on the casing side, a storage chamber on the cover side, said torque transmission chamber and storage chamber being in communication via a fluid inlet and separated by a partition arranged between the casing and the cover, a pin extending through a hole at the center of the cover, of which inner end comes in contact with a slender plate that is a component of a fluid transfer mechanism, and a compression spring acting against said pin at its end through said slender plate, and a fluid transfer mechanism so constructed that hydraulic coupling is increased by outward movement of said pin, while it is decreased by inward movement thereof characterized in that a permanent magnet having a through hole aligned with a center hole of the cover is provided on the outer side wall of the cover and a temperature sensitive magnetic element is fastened to the outer end of said pin, said temperature sensitive magnetic element consisting of Mn-Zn ferrite having a property that the magnetic attractive force between said temperature sensitive magnetic element and said permanent magnet is quickly reduced at a predetermined temperature where the hydraulic coupling is controlled, said temperature sensitve magnetic element being located opposite to said permanent magnet whereby as said temperature sensitive magnetic element senses higher temperature than said working temperature, the magnetic attractive force becomes decreased lower than the counter force by the spring and thereby said temperature sensitive magnetic element is moved away from the permanent magnet in a moment, while as said temperature sensitive magnetic element senses a temperature lower than said working temperature, said attractive force overcomes the spring force and thereby the ferrite is magnetically attracted by the magnet quickly, and thus in the former case, said pin is moved outward instantaneously to increase the hydraulic coupling, while in the latter case, said pin is moved inward instantaneously to decrease the hydraulic coupling.

4,036,340

COMMERCIAL VEHICLE DRIVEN BY AN INJECTION INTERNAL COMBUSTION ENGINE HAVING A TRANSMISSION WITH HYDRODYNAMIC COUPLING OR WITH A HYDRODYNAMIC TORQUE CONVERTER

Ernst-Wilhelm Hufendiek, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 23, 1976, Ser. No. 679,685
Claims priority, application Germany, Apr. 24, 1975, 2518119
Int. Cl.[2] F02D 9/06; B60K 41/16
U.S. Cl. 192—.084 10 Claims



1. A commercial vehicle driven by an injection internal combustion engine, which comprises a transmission including a hydrodynamic device and a by-pass clutch means, and an engine braking means actuatable by way of a switch means, said injection internal combustion engine including an injection pump and controller means for said injection pump having a stop position and an idling position, characterized by an adjusting means operatively connected with the controller means of the injection pump and including an actuating cylinder adapted to be acted upon by a pressure medium and influenceable in dependence on the engine braking means, and control means operatively connected between the adjusting means and the switch means for influencing said adjusting means during operation of the internal combustion engine, said control means being operable upon disengagement of the by-pass clutch means—shortly prior to reaching the idling rotational speed of the internal combustion engine—to effect an automatic adjustment of the controller means for the injection pump from the stop position to the idling position thereof.

4,036,341

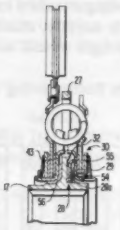
CLUTCH PLATE WITH MULTIPLE SPRING AND FRICTION DAMPERS

Bruno Beeskow, Bietigheim; Günter Wörner, Rommelshausen, and Peter Schrape, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed June 11, 1975, Ser. No. 585,839
Claims priority, application Germany, June 24, 1974, 2430160
Int. Cl.[2] F16D 3/14
U.S. Cl. 192—106.2 15 Claims

1. A clutch disk for motor vehicle main clutches which comprises a disk means carrying friction linings and torsionally elastically arranged with respect to a hub means, several spring means with different characteristics being provided for a multistage torsional elasticity which are arranged in first window means, said hub means including a hub flange and said first window means being arranged in one of the two parts consisting of hub flange and disk means, said spring means also cooperating with corresponding larger, second window means provided in the respective other of said two parts, friction damping means coordinated to the spring means, one of said friction damping means being operable in the idling range and the others being operable in the operating range, and control

means for determining the start of operation of the friction damping means operable in the operating range, characterized in that at least three spring stages of continuously harder characteristics, one friction means for the idling range and two separate main friction means with control means for the operating range are provided, each friction means including at least one friction disk, the control means being so constructed and arranged that the friction disk for the idling range is coordinated to the control means for the first main friction means so



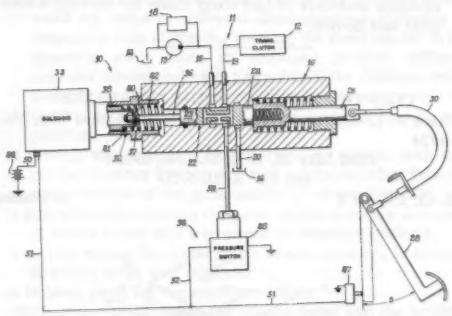
that with the beginning of the second spring stage, in lieu of the idling friction means, the effect of the first main friction means commences and the effect of the second main friction means still starts within the range of the second spring stage in such a manner that its damping action, in addition to the damping action of the first friction means, starts already within the range of the second spring stage by a corresponding distance of the control means thereof with respect to one of window means and spring ends of the third stage.

4,036,342

INCHING VALVE WITH MEANS PREVENTING HIGH PRESSURE INCHING

David S. Finn, Metamora, Ill., assignor to Towmotor Corporation, Mentor, Ohio

Filed June 28, 1976, Ser. No. 700,281
Int. Cl.[2] F16D *25/062*
U.S. Cl. 192—109 F **7 Claims**



1. In a control system for a hydraulic pressure actuated clutch including an inching valve variably shiftable between a full clutch engaging position and a clutch disengaging position and a manual control member connected for normally shifting the valve between said positions for controllably varying the clutch engaging pressure, a pressure limiting arrangement for automatically reestablishing full clutch engagement pressure to the clutch whenever partial clutch engagement pressure exceeds a predetermined level, said arrangement comprising:

biasing means connected to said inching valve sufficient to shift the valve to its full clutch engaging position irrespective of the operation of the manual control apparatus;

actuator means connected for disengaging said biasing means; and

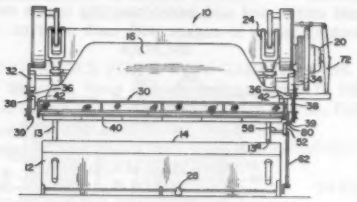
control means for selectively operating said actuator means and including first means responsive to the application of said manual control member to effect the disengagement of said baising means upon a predetermined application of said member, and second means responsive to said clutch engagement pressure for effecting the reengagement of the biasing means when said pressure exceeds a predetermined level.

4,036,343

FAIL SAFE PRESS BRAKE GUARD

John McPhee, Scarborough, Canada, assignor to Rusco Industries, Inc., Los Angeles, Calif.

Filed Aug. 29, 1975, Ser. No. 609,023
Int. Cl.[2] F16D *9/00*
U.S. Cl. 192—134 **7 Claims**



1. A press brake safety device comprising a press brake including a frame having a work positioning means thereon, a ram positioned on the frame for vertical reciprocation towards and away from engaging work on the work positioning means, a drive motor connectable to the ram by a clutch, pitman and eccentric means, and a foot treadle for controlling said clutch to actuate said ram for work engaging movement, the improvement comprising a guard for the ram positioned in front of the same and extending therebelow, air cylinders engaging ends of said guard to mount it on the frame and to move it vertically with but in advance of said ram to and from a position shielding said work positioning means, a lightweight protector bar vertically movably positioned on the lower end of said guard, linkage means connecting said foot treadle to said clutch means to engage the same on depression of said foot treadle, safety means connecting to said linkage means for rendering the same inoperative, and air operated control means connected to said protector bar to actuate said safety means upon movement of said protector bar in relative to said guard.

4,036,344

MULTIPLE-PLATE CLUTCH

John M. Nolan, Pittsfield, Mass., assignor to General Electric Company

Filed Dec. 15, 1975, Ser. No. 640,533
Int. Cl.[2] F16D *47/54*
U.S. Cl. 192—48.3 **3 Claims**

1. A multiple element clutch comprising:

a. two members disposed concentrically about a common axis with either or both of said members having freedom of rotational movement about said axis;

b. a plurality of clutch elements with at least one clutch element carried by each member for interconnecting said members for uniformity of rotation about said axis when said clutch elements are engaged with each other;

c. said clutch elements comprising a series of clutch plates centered on said axis with alternate plates carried by a different one of the two members;

d. said alternate clutch plates carried by one member being keyed to a carrier for rotational movement about said axis with said carrier independently of said member and for translational movement parallel to said axis independently of said carrier;

e. said carrier being ring-shaped, centered on said axis and attached to said one member so as to permit rotational

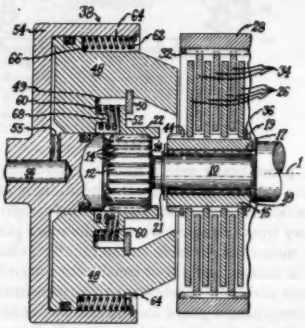
motion about said axis independently of said one member and so as to deny axial translation independently of said one member;

f. said alternate clutch plates carried by the other said member being attached thereto so as to deny their rotational motion about said axis independently of said other member and so as to permit their axial translation independently of said other member;

g. interconnecting means for locking said clutch elements and said carrier to said one member for unitary rotation with respect to said axis;

h. said interconnecting means being a ring-shaped element centered on said axis and keyed to said one member proximate said carrier so as to deny its rotation about said axis independently of said one member and to permit its translation parallel to said axis to permit contact with said carrier;

i. said carrier and said interconnecting means each having locking means to engage with each other on contact to



lock said carrier and interconnecting means together for unitary rotational motion about said axis;

j. actuating means for sequentially:

1. actuating said interconnecting means to lock said one member to its clutch element,
2. causing said plurality of clutch elements to engage each other to interconnect said members with respect to rotation about said axis,
3. disengaging said clutch elements, and
4. deactivating said interconnecting means;

and

k. said actuating means comprising a hydraulic piston supported by one of the members for movement parallel to said axis, said piston including means for translating said interconnecting means into and out of contact with said carrier and means for exerting a force against said clutch elements to press said clutch elements together,

whereby deleterious effects of interaction between disengaged clutch elements as a result of operation in a viscous medium are abated.

4,036,345

CONVEYORS

John Edmund Richard Webb, Bodorgan, Wales, assignor to Hydaroll Limited, Birmingham, England

Filed July 9, 1975, Ser. No. 594,447

Claims priority, application United Kingdom, Oct. 11, 1974, 44156/74

Int. Cl.² B65G *13/12*

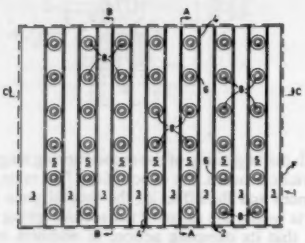
U.S. Cl. 193—35 SS **14 Claims**

1. A platform device for material handling, comprising in combination:

a fixed frame, said fixed frame comprising a plurality of spaced apart first elongate support members and a plurality of first discrete elongate members, said discrete and support members having upper surfaces, said plurality of discrete elongate members being attached to said upper surfaces of said elongate support members and extending at right angles to the length of said elongate support members;

a movable frame, said movable frame comprising a plurality of spaced apart second elongate support members and a plurality of second discrete elongate members, said second discrete elongate members and said second elongate support members having upper surfaces, said second discrete elongate members being attached to said upper surfaces of said second elongate support members and extending at right angles to the length of said second elongate support members;

the fixed and movable frames being so arranged that their



respective elongate support members are parallel and their respective discrete members are parallel and interdigitate;

a plurality of individual rotatable members set in and extending above said upper surfaces of said second discrete elongate members of the movable frame;

inflatable means disposed under and attached to said second elongate support members of said movable frame and operable for raising and lowering the movable frame as a unit so that in a lower position of said movable frame a load can be supported on said upper surfaces of said first discrete elongate members of said fixed frame and in a raised position of said movable frame said rotatable members extend above the upper surfaces of said first discrete elongate members of said fixed frame for moving a load over said device.

4,036,346

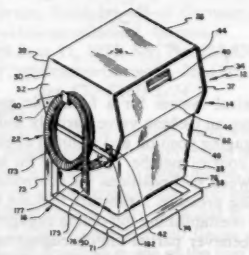
COIN OPERATED VACUUM APPARATUS

Richard W. Livingston, 10100 Raytown Road, Kansas City, Mo. 64134

Filed May 28, 1976, Ser. No. 690,897

Int. Cl.² A47L *5/00*

U.S. Cl. 194—9 T **12 Claims**



1. A vacuum apparatus generally used in vehicle cleaning operations, comprising:

a. a housing means connected to a basic support means;

b. said housing means including a cover head assembly pivotally connected to said basic support means and a

receptacle assembly removably connected to said basic support means;

c. said receptacle assembly having a canister member with an upper opening and an inlet air opening;

d. a vacuum power means mounted on said canister member to seal around said upper opening by weight of said vacuum power means and suction generated thereby;

e. said vacuum power means having a filter and motor assembly mounted on a motor head support assembly; and

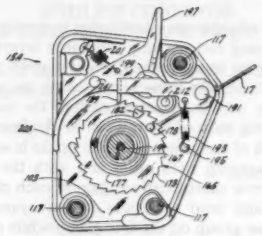
f. said filter and motor assembly having a vacuum motor member operable when energized to draw inlet air through said inlet air opening, a portion of said motor member, and discharged through said motor head support assembly.

4,036,347

COIN TOTALIZER FOR DIFFERENT DENOMINATIONS

Barry L. Smith, Florissant, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,310
Int. Cl.² G07F 5/08
U.S. Cl. 194—48 **7 Claims**



1. A coin totalizer comprising:

a ratchet member rotatable on an axis in a forward direction away from a zero position in steps corresponding to a unit coin value and in reverse direction back to zero position;

a pawl carrier rotatable on said axis away from a retracted position and in return direction back to retracted position;

trip means extending from said pawl carrier movable downward by coins of different denominations dropping in respective coin chutes for rotating the pawl carrier in the direction away from its retracted position different amounts corresponding to the value of the different coins, said trip means being released after rotation by a coin for upward return and return of the pawl carrier to retracted position;

a driving wheel on said pawl carrier engageable with said ratchet member for stepping said ratchet member forward upon rotation of the pawl carrier in return direction;

a first spring for rotating the pawl carrier in return direction to return it and said trip means to retracted position;

a second spring for rotating the ratchet member in reverse direction to its zero position;

a holding pawl for the ratchet member;

reset means for releasing the driving pawl and the holding pawl for resetting the ratchet member to zero position;

a lockout member movable between a retracted position and an operative position;

a latch for said lockout member movable between a retracted position wherein the lockout member is free to move to its operative position and a latching position wherein it latches said lockout member in retracted position;

means biasing the latch to its retracted position;

means on said ratchet member engageable with said latch when the ratchet member returns to its zero position for moving the latch against its bias to its latching position and determining the zero position of the ratchet member;

said first spring being characterized in that the force exerted thereby on the pawl carrier for returning the pawl carrier and trip means to retracted position after a coin has driven the trip means down is lower than the force applied via the trip means by a coin of the lightest weight to be handled, said first spring exerting force on the ratchet member via the pawl carrier and driving pawl in opposition to the second spring when the trip means moves up and the pawl carrier and driving pawl step the ratchet member forward,

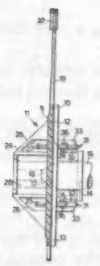
said second spring being characterized in that the force exerted thereby on the ratchet member when the ratchet member is at its zero position is sufficient to overcome the latch biasing means for movement of the latch to its latching position when the ratchet member returns to its zero position but insufficient when the ratchet member is at its zero position and as it rotates forward to overcome the first spring, whereby the first spring is effective to return the pawl carrier and trip means to retracted position when the ratchet member is stepped forward.

4,036,348

FIXING DEVICE FOR A TYPE-CARRIER DISK

Giampaolo Guerrini, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti, Ivrea (Turin), Italy

Filed July 8, 1975, Ser. No. 594,067
Claims priority, application Italy, July 10, 1974, 69194/74
Int. Cl.² B41J 1/30
U.S. Cl. 197—53 **14 Claims**



1. A fixing device for attaching a type-carrier disk with flexible tongues to a selection shaft of a printing machine, wherein said selection shaft has a shaft axis and includes contrast means defining a rotation plane substantially perpendicular to said shaft axis and a conical end, said contrast means extending radially outwardly a predetermined radial distance from said shaft axis, and wherein said type-carrier disk comprises a central part and a conical seat for cooperating, respectively, with said contrast means and said conical end for aligning said type-carrier disk with respect to said selection shaft, and means for exactly defining the angular position of said disk with respect to said selection shaft, said fixing device comprising:

at least one aperture in said disk, said aperture being defined in part by a first aperture edge radially spaced from said shaft axis a distance less than said predetermined radial distance,

at least one attachment member supported by said selection shaft and extending axially beyond said rotation plane and at an angle thereto, said attachment members being extendable through said apertures, each of said attachment members being movable between a first position wherein said attachment member can be passed through said aperture and a second position wherein said attachment member engages said first edge of said aperture,

resilient means urging said attachment members toward said second position so that when said attachment means extends into said aperture said attachment means engages said first edge to hold said type-carrier disk against said contrast member and said conical seat against said conical end, and

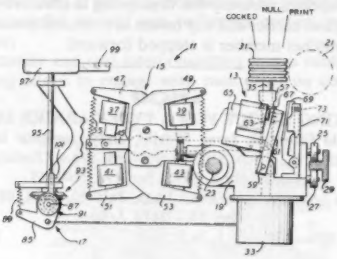
knob means for attaching and detaching said type-carrier disk.

4,036,349

COMBINED MECHANISM FOR IMPACTING A PRINT MEMBER AND ADVANCING A PRINTING RIBBON

Edward Feldman, Teaneck, and George Lupinacci, Nutley, both of N.J., assignors to Sweda International, Inc., Pinebrook, N.J.

Filed Feb. 28, 1975, Ser. No. 554,002
Int. Cl.² B41J *33/22, 33/32*
U.S. Cl. 197—151 **7 Claims**



1. A device for impacting a print member and advancing a printing ribbon comprising:

print means comprising a rotatable print member having a plurality of print bands thereon and having null, cocked, and print positions,

yoke means for supporting said print member therein,

support means having said yoke means rotatably mounted thereon,

electromagnetic means having a stator and an armature, said stator being mounted on said support means and said armature being coupled to said yoke means, for actuating said print means thereby causing said print member to impact,

a ribbon advance means coupled to said yoke means, for advancing said ribbon one increment each time said electromagnetic means is energized,

said ribbon advance means including a first elongated link member;

said first link member having an upper end and a lower end, said upper end being pivotably coupled to said yoke means;

a second link member pivotably coupled to said supporting means,

one-way clutch means, connected to and driven by said second link member, for moving said printing ribbon in only one direction, and

a flexible cable connecting means, coupled to said first and second link members, wherein

said first link member is rotated in a first direction, said flexible cable connecting means is drawn taut, and said second link member is rotated in a first direction, whereby said one-way clutch means is engaged thereby advancing said ribbon one increment when said electromagnetic means is energized, wherein

said first link member is rotated in a second direction, opposite to said first direction, said flexible cable connecting means goes slack, and said second link member is rotated in said second direction, when said electromagnetic means is de-energized, and wherein

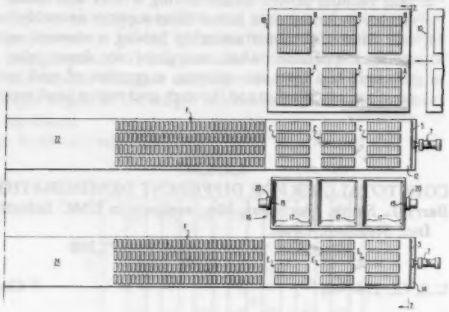
said first link member is rotated in said first direction, said flexible cable connecting means remains slack, and said second link member remains stationary, after said print member impacts.

4,036,350

METHOD AND APPARATUS FOR HANDLING BRICK FOR INSPECTION AND FEEDING

Robert E. Jones, 15 S. Oak Forest Drive, Asheville, N.C. 28803

Filed Jan. 8, 1974, Ser. No. 431,637
Int. Cl.² B65G *57/00*
U.S. Cl. 198—420 **2 Claims**



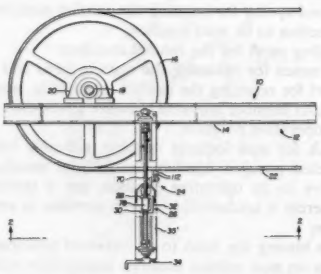
1. A method of separating bricks for inspection and subsequently regrouping and stacking them into layers comprising the steps: arranging two groups of bricks in rows on a horizontal plane with the bricks in each row being spaced in end-to-end relationship with the faces of each of the bricks exposed upwardly, spacing each of the rows of bricks from each other, regrouping each of the groups with the bricks in adjacent rows substantially engaging each other and with the ends of the bricks in each row substantially engaging each other, feeding one of the groups onto an article of conveyance, and then feeding the other group on the first group while on the article of conveyance and wherein the rows of bricks are spaced from each other by conveying the two groups on to horizontal conveyor surfaces movin faster than the speed of the bricks as they arrive on said horizontal conveyor surfaces, and wherein prior to depositing the second group of bricks on the first group of bricks a horizontal plate is inserted over the first group of bricks, the second group of bricks is placed on the horizontal plate, and the horizontal plate is retracted out from between the two groups of bricks to deposit the second group of bricks on the first group of bricks.

4,036,351

CONVEYOR BELT CLEANER

Robert C. Reiter, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

Filed Feb. 12, 1976, Ser. No. 657,351
Int. Cl.² B65G *45/00*
U.S. Cl. 198—499 **8 Claims**



1. A conveyor belt cleaner for a conveyor including a frame, a rotatable drum carried by the frame and an endless belt trained about the drum and providing delivery and return runs,

said cleaner including a vertically movable support adapted to be mounted transversely of the belt to be cleaned, a wiper blade engageable with said belt, means for mounting said wiper blade on said support, and jack screw means adapted to be interposed between the frame and said support and effective upon operation thereof to move said support and wiper blade relative to the belt, and wherein said support includes a pair of spaced apart, generally horizontal upper and lower flanges connected by a vertically extending web, an opening in the upper flange, a tubular collar disposed about the opening in said upper flange, said collar being secured to said upper flange and extending from the upper side thereof, a threaded shaft extending through said collar and said flanges, abuttment means secured to said shaft adjacent the lower side of said upper flange, a spring interposed between said collar abuttment means and said lower flange for biasing said blade towards the belt, a wiper blade support secured to the upper end portion of said shaft, means securing said wiper blade to said wiper blade support, and adjustment means carried by said threaded shaft for varying the biasing force of spring.

4,036,352

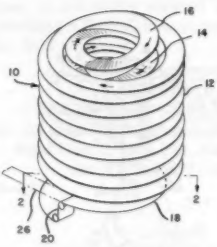
ENDLESS CONVEYOR

David Laverne White, Dallastown, Pa., assignor to Alto Corporation, Pa.

Continuation of Ser. No. 600,493, July 30, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,469

Int. Cl.[2] B65G *15/02*

U.S. Cl. 198—778 **1 Claim**



1. An endless conveyor including a closed path for a continuous conveyor belt; a support extending along the path; an endless belt on the path resting on the support and having an inner edge and an outer edge; drive members located at spaced intervals along the inside path for moving the belt downstream along the path; said belt including a number of rods extending laterally across the width of the path and resting upon the support, integral links at the ends of the rods defining an inner chain of links and an outer chain of links, each link of the outer chain extending from its respective rod along the path and around an adjacent rod, said drive members engaging links of said inner chain to move the belt downstream along the path, wherein the improvement comprises each link in said inner chain extending from its respective rod upstream with respect to the direction of movement of the belt and around the adjacent upstream rod to define a link recess and to secure the adjacent rods together and thereby fix the pitch of the inner chain; the interior openings of the links of the outer chain having sufficient width and length along the path so that the rods float in such openings and are free for limited movement toward and away from each other so that the pitch of the outer chain is free to vary in response to change in the radius of curvature of the path, whereby drag forces exerted on the rods by said support bias the rods upstream with respect to the links of the inner chain and force the inner links against the link recesses of their respective upstream rods to lock the inner links together to support the rods without column loading of the rods.

4,036,353

TRANSFER APPARATUS FOR GRIPPING AND HOLDING A SPINNING COP

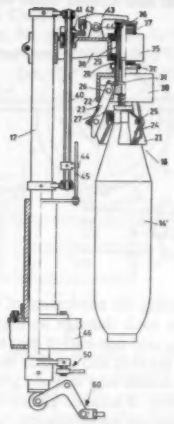
Xaver Suter, Thalwil, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed June 21, 1976, Ser. No. 697,944

Claims priority, application Switzerland, July 3, 1975, 8684/75

Int. Cl.[2] B65G *47/74*

U.S. Cl. 198—486 **10 Claims**



1. Transport apparatus for gripping and holding spinning cops (14') to transport the cops in automatic winding machines (10, 11) comprising

gripper means (16) having a centering cone (32) to center a spinning cop form (14') and a plurality of circularly located gripper jaws (21) arranged to engage the outer surface of an end (14'') of the cop form and to clamp the cop (14') therebetween;

operating levers (23) linked to and supporting the gripper jaws (21);

spring means (27) attached to the respective gripper jaws (21) and to the respective operating levers (23) and tending to hold the jaws in open position but permitting rocking of the jaws (21) to a cop engaging position;

said gripper jaws defining an area forming an engagement zone (21') located on facing surfaces of the gripper jaws (21) and positioned relative to the attachment point of the spring means (27) on the jaws (21) to effect closing movement of the gripper jaws (21) to cop engaging position upon axial pressure directed against said engagement zone (21') by said end (14'') of the cop (14').

4,036,354

CONVEYOR BELT CLEANER

Robert C. Reiter, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

Filed Dec. 22, 1975, Ser. No. 642,757

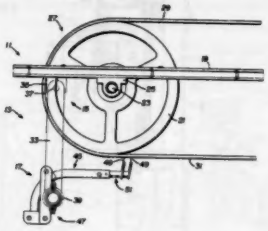
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.

Int. Cl.[2] B65G *45/00*

U.S. Cl. 198—499 **14 Claims**

1. A scraper blade assembly for a belt cleaner mounted on a conveyor system having a rotatable drum and an endless belt trained about said drum and providing delivery and return runs, said belt cleaner including a support fixedly located transversely of and adjacent to one of said runs and having a plurality of individual scraper blade assemblies operably disposed along said support, each of said scraper blade assemblies comprising: a generally L-shaped arm having an arcuate midportion; a bracket assembly rigidly connected to said support

and including plate means for pivotally supporting said arm at said arcuate midportion so as to limit the lateral movement and canting of said arm, said plate means including a pair of parallely opposed upright plates; an individual and distinct scraper blade mounted on one end of each of said arms; tension spring means connected between the other end of said arm which is disposed on the opposite side of said pivotally supported midportion from said one end on which said scraper blade is mounted and said bracket assembly for tensioning said other end toward said bracket assembly to urge said arm to pivot in one direction and bias said scraper blade toward said one run;



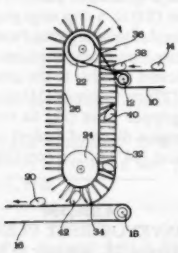
a stop means for limiting the movement of said arm in said one direction to prevent such damage as may occur when said blade becomes worn, said one end of said arm further includes a relatively straight portion and a blade mounting means telescopically received within said straight portion for enabling a staggered arrangement of scraper blades to be achieved with only uniform, completely substituteable arms whose lengths may be telescopically adjusted, said blade mounting member including a flange connected to the distal end of said blade mounting member and fastening means for securing said wiper blade to said flange.

4,036,355

EGG ESCALATOR

Roberto Valli, Via IV Novembre 1/a, Galatea (Forli), Italy

Filed May 27, 1975, Ser. No. 581,049
Claims priority, application Italy, June 11, 1974, 12021/74
Int. Cl.[2] B65G *19/00*
U.S. Cl. 198—607 **2 Claims**



1. An egg escalator for transfer of eggs delivered along a first powered horizontal conveyor at an upper level onto a second conveyor at a lower level, the path between said conveyors being essentially vertical, comprising: a first roller rotatably supported in a fixed position in front of and higher than the conveyor at the upper level;

a second roller rotatably supported beneath and parallel to the first roller and directly above the conveyor at the lower level;

a belt extending around said rollers for driving support therewith, and defining a path comprising two vertical runs and an upper and lower bend, the belt having rigidly connected, resilient and flexible spiked projections at right angles to its surface, the projections being at least as long as the average length of an egg and being close to each other along the length and the width of said belt whereby each egg is held by at least two projections, each egg deflecting at least two projections and being held by said at least two deflected projections during the transfer; the projections urging each egg away from the belt onto said conveyor at the lower level;

a screen stationarily supported at close distance in front of the belt projections and extending between the two conveyors;

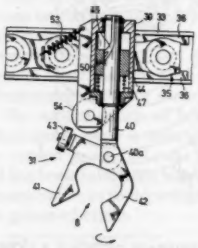
driving means connected to the first roller for driving the belt so that its portion in front of the screen moves from said conveyor at the upper level toward said conveyor at the lower level, said first horizontal conveyor at the upper level force feeding the eggs at a point below the upper bend between the spiked projections of said belt whereby the eggs travel along a vertical path immediately after being fed on the belt without going through the upper bend.

4,036,356

PRODUCT HANDLING EQUIPMENT FOR AN IMBRICATED PRODUCT FORMATION

Walter Reist, Schonenbergstrasse 16, 8340 Hinwil, Switzerland

Division of Ser. No. 411,689, Nov. 1, 1973, Pat. No. 3,948,551.
This application June 16, 1975, Ser. No. 587,341
Claims priority, application Switzerland, Nov. 10, 1972, 16383/70
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.[2] B65G *15/00*
U.S. Cl. 198—680 **10 Claims**



1. Equipment for the handling and manipulation of articles, especially printed products arriving in fish-scale formation, comprising a multiplicity of clamps for engaging said products, means for operatively connecting said multiplicity of clamps with one another, each of said clamps comprising clamp jaws having clamping surfaces for engaging a product, said clamp jaws forming a clamp gap when the clamp is closed, means for pivotably mounting said clamp jaws of each clamp about a pivot axis, said clamping surfaces being substantially perpendicular to said pivot axis, the clamp jaws of each clamp being pivotable in planes substantially perpendicular to said pivot axis in a substantially scissor-like manner at the region of the clamp gap away from one another into their open position and towards one another into their closed position, the scissor-like pivoting of said clamp jaws into their closed position causing gripping engagement of said clamping surfaces with the article.

4,036,357

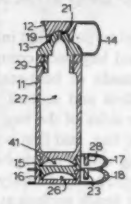
CONTACT LENS CASES

John Cas Czelen, 550 Whitehaven Parkway NW., Washington, D.C. 20007

Filed Jan. 14, 1976, Ser. No. 649,022
Int. Cl.[2] A45C *11/04*; B65D *85/54*
U.S. Cl. 206—5.1 **1 Claim**

1. A contact lens case of one functional unit, there being no

segments completely disattachable from the unit during normal use, constructed of a flexible, plastic-like material, comprising: a fluid reservoir of cylindrical design, a concave depression on the base of said reservior creating a primary storage space for a contact lens, a snap-fit primary lens storage cap covering the primary lens storage space, a protruding lip appended to the primary lens storage cap to aid manipulation, a strap hinge connecting said primary cap with said reservoir, a concave depression on the outer surface in the base of said primary lens storage cap creating a secondary storage space for a contact lens, a snap-fit secondary storage cap covering



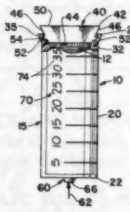
the secondary lens storage space, a protruding lip appended to the secondary lens storage cap to aid manipulation, a strap hinge connecting said secondary cap with the strap of the primary cap, transverse ribs on the strap hinges for the storage caps, a fluid dispensing structure on the upper end of the fluid reservoir cylinder, a snap-fit cap enclosing the fluid dispensing structure, an interlocking fit between the fluid dispensing structure and the fluid reservoir whereby the fluid dispensing structure may be releasably secured to said fluid reservoir cylinder, providing a fluid-tight seal, and separable to provide access to the fluid reservoir.

4,036,358

CLEAR VIEW COIN WRAP

Philip Kelley, 32 Leighton St., Pepperell, Mass. 01463

Filed Nov. 2, 1976, Ser. No. 738,245
Int. Cl.² A45C *11/00*
U.S. Cl. 206—.82 **10 Claims**



1. A reuseable coin holder for use in removably holding a specific number of coins of a particular diameter within the confines thereof including:

a. a cylindrical shell having a closed end defined by a bottom wall and an open end for insertion of the coins therein in stacked relationship,

b. said open end formed by a frusto-conical section including a tapered wall having an inner surface inclined relative to said shell in order to facilitate the entrance of the coins therein,

c. closure means operatively associated with said section and adapted to be removably secured thereto and extend thereacross and close off said open end when the coins are stacked therein, said closure including:

1. an elongated body element having a bottom end and a top end in spaced relationship to each other,

2. an outer end on each side of said body element tapered to substantially conform to said inner wall of said section,

3. a pair of aligned apertures in said inner wall of said section, and

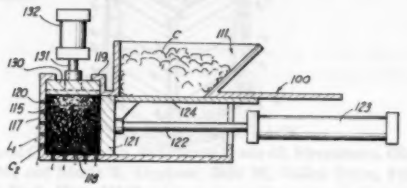
4. a pair of prongs extending outwardly from each said outer end and adapted to snap into said apertures such that said closure is retained in fixed position on said shell with the stacked coins contained therein.

4,036,359

BALED WOOD CHIPS

Claudius R. Strickland, Jr., Ashburn, Ga., assignor to American Hoist & Derrick Company

Continuation of Ser. No. 431,104, Jan. 7, 1974, abandoned. This application June 2, 1976, Ser. No. 692,055
Int. Cl.² B65D *71/00*
U.S. Cl. 206—83.5 **4 Claims**



1. A wood chip product suitable for producing paper pulp comprising a quantity of green, naturally moist wood chips in a compressed condition generally perpendicular to the general planes of said chips and having the fibres of adjacent chips intermeshed, said fibres retaining their integrity, said quantity of wood chips occupying from approximately one-half to approximately one-sixth its normal volume and having a substantially reduced quantity from its normal amount of clear liquid, therein.

4,036,360

PACKAGE HAVING DESSICANT COMPOSITION

Robert J. Deffeyes, Arlington, Tex., assignor to Graham Magnetics Incorporated, Graham, Tex.

Filed Nov. 12, 1975, Ser. No. 631,361
Int. Cl.² B65D *81/26*; F17C *11/00*; B32B *5/16*; C09K *3/00*
U.S. Cl. 206—204 **10 Claims**

1. A dessicant composition of the type adapted to absorb moisture in packing applications comprising

at least 20% of a particulate dessicant material and

b. as a binder therefor, an effective quantity of an organic resin comprising at least about 50% of a prepolymerized polyurethane resin having an MVT value of at least 40 grams per 24 hours per 100 in², and wherein said polyurethane has the following minimal physical characteristics:
Tensile strength — 1000 psi and
Elongation — 200%.

4,036,361

COLLAPSIBLE CONTAINER

Leo Jacobson, 59 Cathay Road, and Wallace Forman, 66 Newkirk Ave., both of East Rockaway, N.Y. 11518

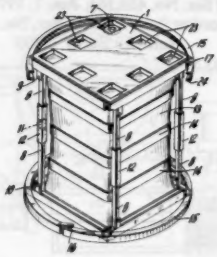
Filed Dec. 18, 1975, Ser. No. 642,119
Int. Cl.² B65D *19/00*
U.S. Cl. 206—386 **16 Claims**

1. A collapsible containing device for containing both liquid and solid cargoes, said device comprising:

a flexible component as the primary containing means which is in the form of a bag or sleeve attached at its upper and lower extremities to the upper and lower plates of a collapsible supporting frame;

a collapsible supporting frame comprising an upper rigid plate having an opening therein with closure means for filling and emptying the containing device and a lower

rigid plate, said plates are attached to each other by collapsible leg members fixedly secured along the perimeter of each of said plates by hinge means which enable said leg members to have an open or extended position and a closed position, wherein said leg members in the open or extended position are perpendicular to said plates and are sufficiently long to fixedly support the upper plate in elevated relation above the lower plate to enable the outer sides of said flexible component to be substantially vertical and taut when the device is filled with cargo, and wherein in the closed or collapsed position the leg members reduce



in length so that the upper and lower plates become substantially adjacent to one another and wherein the flexible component collapses toward the three-dimensional center of the containing device;

said containing device characterized as having sufficient strength and endurance to be used in both manual and mechanized transporting systems and where said device efficiently utilizes storage and carrier space when full with cargo and is capable of collapsing when empty to a compact configuration which is significantly smaller in volumetric size than its open configuration.

4,036,362

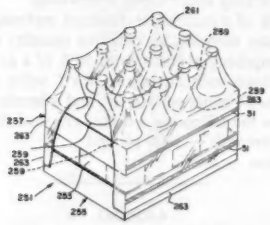
PACKAGE

John E. Ullman, Huntingdon Valley, Pa., assignor to Huntingdon Industries Incorporated, Bethayres, Pa.

Continuation-in-part of Ser. No. 404,642, Oct. 9, 1973, Pat. No. 3,890,763. This application Mar. 31, 1975, Ser. No. 563,667

Int. Cl.[2] B65D *65/14, 65/38;* **B65B** *53/00*

U.S. Cl. 206—432 **2 Claims**



1. A package for articles such as cans, bottles, and the like, comprising a tray having a bottom and upstanding walls extending therefrom with a first pair of spaced-apart walls connected together by a second pair, a sheet covering said articles, and adhesive means connecting the sheet to the first pair of walls to hold the articles to the tray, said film sheet being pressed against said adhesive and said walls to effect an adhesive connection prior to heat shrinking said film sheet, an inverted top tray positioned on top of the articles to keep the articles in vertical alignment, the inverted top tray being covered by said sheet, said top tray having a bottom resting on the top of the articles with walls extending downwardly from said bottom and surrounding said articles to keep the articles confined within said walls to hold the articles against tilting, said inverted top tray being provided with holes that receive the tops of the articles, said sheet covering the tops to the articles.

4,036,363

AUTOMATIC FILLING OF BAGS

Robert J. Kugler, East Meadow, N.Y., assignor to Action Packaging Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 434,377, Jan. 18, 1974, abandoned, which is a continuation of Ser. No. 274,509, July 24, 1972, abandoned. This application Apr. 8, 1976, Ser. No. 674,872

Int. Cl.[2] B65D *85/54, 33/28*

U.S. Cl. 206—526 **4 Claims**

1. A bag-pack adapted to be loaded into a machine for automatic filling of bags, said bag-pack comprising:

a plurality of bags made of heat-sealable plastic material, each bag having first and second walls joined by heat-sealed seams at the sides of the bag and defining an opening at the top of the bag, said first wall having a hem at the top thereof defining a first passageway open at each end, a strip of plastic protruding directly through said opening and attached to the inside surface at the top of said second wall by two heat-sealed seams extending across said wall from one side to the other, said heat-sealed seams defining a second passageway open at each end, and cord-closure means contained in said first and second passageways and being adapted to draw the top of the bag closed; and

means engaging said strips of plastic for retaining said bags in a stack arrangement.

4,036,364

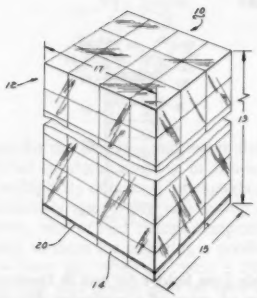
UNITIZED PALLETLESS LOAD AND METHOD OF FORMING SAME

Everett J. Ambrose, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 8, 1976, Ser. No. 674,753

Int. Cl.[2] B65D *85/16, 63/00*

U.S. Cl. 206—526 **4 Claims**



1. In a palletless load unit which includes:

vertically stacked layers containing plural articles comprising lightweight plastic containers, each having a weight range of from about 0.03 to 0.13 grams per cubic centimeter of internal volume, said load unit exerting a pressure of between about 15 to 150 pounds per square foot, the improvement which includes:

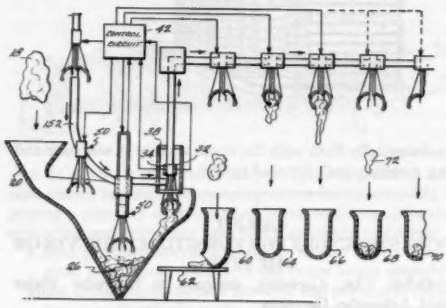
strapping means locally perimetrically disposed around the vertical side walls of the lowermost layer and compressively engaging outer articles therein at a force of between about 5 to 50 pounds to unitize such outermost layer, said strapping means being vertically narrow having a height substantially less than that of said articles in said lowermost layer and except for the weight of the upper layers, said lowermost layers being unrestrained from movement in the vertical direction.

4,036,365

LINEN SORTER WITH A CONVEYOR MOUNTING INDIVIDUAL LINEN PICKERS

Howard Rosenfeld, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 18, 1975, Ser. No. 569,570
Int. Cl.[2] B07C 5/34
U.S. Cl. 209—73 21 Claims



1. A system for sorting articles at least some having attached as a part thereof a quantity of at least one material which produces secondary radiation at a predetermined energy level in response to impinging radiation and which forms a code identifying the article comprising:

a source of radiation,

a plurality of picker means each including means for grasping and releasing an article,

a hopper for receiving said articles,

means for conveying each said picker means over said hopper so as to grasp an article therein and conveying an article grasped thereby randomly oriented past said source and thereafter past a plurality of article locations,

a detector for receiving said secondary radiation and producing an electrical output signal indicating the material attached to said article and accordingly identifying the article, and

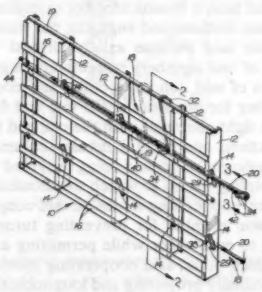
means connected to said detector for causing each picker means to release a grasped article after movement past said source and detector at one of said locations in accordance with said output signal.

4,036,366

STORAGE RACK AND HANGER ASSEMBLY

Cal L. Dixon, and Charles E. Ross, both of Tulsa, Okla., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 17, 1976, Ser. No. 667,741
Int. Cl.[2] E05B 73/00
U.S. Cl. 211—4 4 Claims



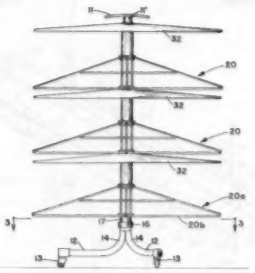
1. A meat hook rack and hanger assembly for supporting and immobilizing meat hooks and the like comprising the combination of a frame provided with posts and each of said posts having at least one inclined elongated slot aligned with a similar slot on an adjacent post, a first bar means fixedly mounted on the frame and a second bar means mounted within the slots of the posts of said frame and in movable spaced and generally parallel relation to said first bar means, each of said bar mans having such a configuration as to be engageable with only one of the separate and opposed curved end portions of a generally S-shaped meat hook and locking means engageable with selected parts of the frame and the second bar means for immobilizing the second bar means and the meat hooks engaged therewith after said second bar means has been moved a selected distance away from the first bar means and the selected parts of the second bar means and the frame brought into registry with each other.

4,036,367

ROTATABLE SHOE RACK

Sherwood C. Stambaugh, 9453 State Route 43, Streetsboro, Ohio 44240, and Marie K. Hephner, 3881 W. Valley Drive, Fairview Park, Ohio 44126

Filed Oct. 14, 1976, Ser. No. 732,539
Int. Cl.[2] A47F 5/02, 7/08
U.S. Cl. 211—37 8 Claims



1. A rotatable shoe rack comprising a base, a vertical column supported on the base, at least two vertically spaced wire racks independently rotatably mounted on said column, said racks having concentric wire rings at different levels for supporting shoes in side-by-side positions, said rings connected to radial spokes having vertical hub portions rotatable on said column, spacer sleeves tightly and non-rotatably fitting the column above each of said hub portions, and disk covers supported on the upper ends of said spacer sleeves and extending over the racks immediately below.

4,036,368

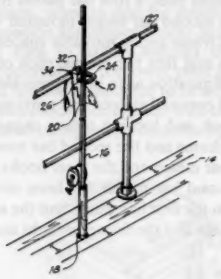
FISHING ROD APPLIANCE

Daniel Munsch, 17 Abrew St., Bayshore, N.Y. 11706

Filed June 5, 1975, Ser. No. 584,129
Int. Cl.[2] A01K 97/10
U.S. Cl. 211—60 R 6 Claims

1. A fishing rod holder comprising a first section having two arcuate shaped portions bent in opposite directions and a second section of substantially planar shape in substantial non-axial alignment with said first section, said second section being generally U-shaped and having its distal ends bent inward towards each other, said first section having means to

mount said holder, said second section including an internally threaded recess, fastening means containing a wood thread at



one end and a metal thread at an opposite end, said metal thread engaging said recess in male-female engagement.

4,036,369

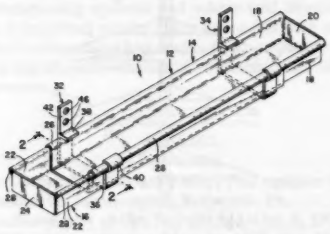
EXPANDABLE RACK

Stephanie Eisenberg, New York, N.Y., assignor to Nash Metalware Co. Inc., New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,588

Int. Cl.[2] A47F *5/08*; E04D *13/06*

U.S. Cl. 211—88 4 Claims



1. An expandable rack comprising (1) shelf means consisting of a plurality of shelf sections and (2) bracket means for slidably supporting said shelf means at loci intermediate the outer ends thereof and for securing said shelf means to surfaces adjacent only one longitudinal side of said shelf means, said shelf sections being adapted to slide longitudinally into or out of one another whereby the length of said rack and the position of said shelf means with respect to said bracket means can be varied while said bracket means is secured to said surfaces.

4,036,370

GOODS STOWAGE UNIT

Alfred Eugéne Chevalier, Quartier Notre Dame, 83260 La Crau, France

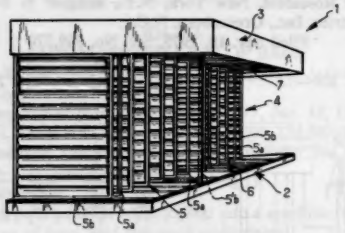
Filed Mar. 25, 1976, Ser. No. 670,564

Claims priority, application France, Feb. 2, 1976, 76.02803

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—162 3 Claims

1. Goods stowage unit of the type comprising a framework having a base and a false-ceiling substantially parallel with the said base and rigidly connected to the latter, a set of vertical parallel storage elements mounted between and extended obliquely with respect to said base and said false-ceiling, said base having a set of parallel grooves of pressed steel sheet, in each groove is accommodated, over substantially the whole length of said groove, a channel bar with flanges, grooved rollers on opposite sides of some of said storage elements and cooperating with said flanges, the free ends of said flanges



being substantially flush with the upper surface of said base and defining a rolling path for said rollers.

4,036,371

SUPPORT STRUCTURE FOR FURNITURE, SHELVES OR THE LIKE

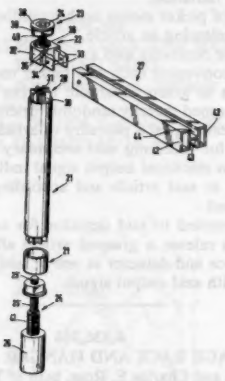
Karl Michel, Ulm, Germany, assignor to Gebruder Vieler GmbH, Letmathe, Germany

Filed Feb. 13, 1976, Ser. No. 657,832

Claims priority, application Germany, Feb. 18, 1975, 7504893[U]

Int. Cl.[2] A47B *96/14*

U.S. Cl. 211—182 10 Claims



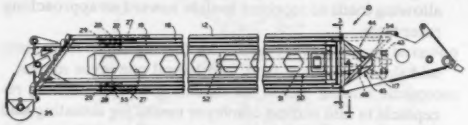
1. A support structure for furniture or the like comprising at least one vertical column and at least one crossbar releasably connected to said column, said column comprising at least two tubular column sections, each having one end face abutting against a corresponding end face of an adjacent column section and an opposite end face, a tension member extending through said tubular column sections and engaging the inner surfaces thereof to maintain said sections axially aligned with each other, and a pair of end members respectively engaging said opposite end faces of said column sections and connected to said tension member for maintaining the one end face of one column section in tight abutment with the one end face of the other column section, one of said tubular column sections constituting a coupling member and being provided with laterally extending coupling means to which the crossbar is releasably connected; and cooperating means on said coupling member and said tension member for preventing turning of said members relative to each other while permitting axial movement relative to each other, said cooperating means comprising a plurality of radially projecting and longitudinally extending ribs on said tension member and at least one longitudinally extending groove in said coupling member in which one of said ribs is engaged.

4,036,372

EXTENSION AND RETRACTION MEANS FOR THE TELESCOPIC BOOM ASSEMBLY OF A CRANE

Kamlaker P. Rao, Aurora; William L. Lowe, Naperville, and O. Thomas Nephew, Geneva, all of Ill., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 15, 1975, Ser. No. 641,191
Int. Cl.[2] B66C 23/70
U.S. Cl. 212—144 17 Claims



1. In a mobile material handling apparatus, such as a rotatable crane, having a telescoping crane boom assembly comprising a plurality of telescoping boom sections, apparatus for extending and retracting said boom assembly including:

a fluid pressure operated cylinder nested within the innermost telescoping section of the crane boom assembly,

guide means mounted on a movable end portion of the cylinder to protectively enclose the cylinder and to maintain the orientation thereof with respect to the telescoping sections of the crane boom assembly,

a plurality of means linearly aligned for locking respective adjacent movable sections of a telescoping crane boom assembly in assembled relation, and

a latch mechanism mounted on the guide means, said latching mechanism comprising

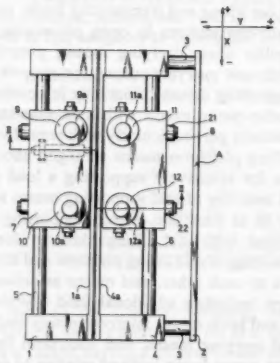
first latching means for engaging a boom section for extension and retraction thereof by means of the cylinder, and second latching means, distinct from the first latching means, for selectively and cooperatively engaging one of said boom locking means for locking and unlocking thereof to permit extension and retraction of a selected movable section of the boom assembly.

4,036,373

AUTOMATIC INSPECTION APPARATUS

Igarashi Taenzi, and Tsubota Toshio, both of Kyoto, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 3, 1975, Ser. No. 628,120
Claims priority, application Japan, Nov. 9, 1974, 49-129215
Int. Cl.[2] B25J 9/00
U.S. Cl. 214—1 BB 5 Claims



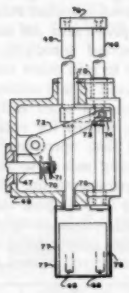
1. An automatic inspection apparatus comprising a carrier body on the (Y, −) side which is slidably supported by X-direction guide rods, and a carrier body on the (Y, +) side slidable on both X- and Y-direction guide rods, each carrier body accommodating a plurality of tap shafts vertically movable therethrough, so that the tap shafts are raised and lowered as desired for the inspection of an object to be inspected, characterized in that each carrier body houses a drive shaft operatively coupled to a prime mover for rotation, a plurality of screw gears, each of which is spring-biased in one way, are fitted on the drive shaft axially slidably thereon, said screw gears and tap shafts being operatively interconnected through gear means to raise and lower the tap shafts, so that in case of overloading on the load side the screw gears are tripped against the spring forces and the displacements of the screw gears can be detected, each of said gear shafts having at one end of skew gear in mesh with one of the screw gears and at the other end a pinion mesh with a rack provided on the associated tap shaft.

4,036,374

MULTI-MOTION PARTS HANDLER

Duane W. Woltjen, Manchester, Mo., assignor to AMC Industries, Inc., Stamford, Conn.

Filed Nov. 4, 1975, Ser. No. 628,474
Int. Cl.[2] B65G 47/91
U.S. Cl. 214—1 BB 17 Claims



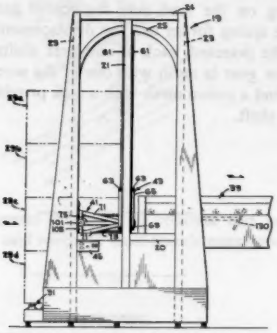
1. A multi-motion parts handler for use in transferring a part from one position and through a variety of motions to another and the intended position, including transfer means for use in supporting a part through its variety of said motions, said transfer means including at least one arm capable of reciprocal movement in a lineal direction, means operatively associated with said arm to induce said movement in the said lineal direction, a shaft coupled to said transfer means and disposed for inducing its reciprocating motion in another lineal direction, a roller gear indexing drive operatively associated with said shaft and provided for inducing the transfer means in an oscillating motion, said roller gear indexing drive including in combination an indexing cam and roller follower hub, said roller follower hub being secured to said shaft, means associated with said indexing cam for inducing said shaft and its coupled transfer means into its reciprocating movement in the said another lineal direction, motor means which when energized providing for rotation of said indexing cam and inducing movement of the said means operatively associated with said arm, a speed reducer coupled with said motor means and providing for a reduction in its speed of rotation, whereby upon actuation of said indexing drive and the means associated with the arm said transfer means and its arm is induced into a plurality of movements for precision transfer of a part.

4,036,375

BIN DESTACKER AND RESTACKER

Wayne L. McClintic, Riverside, Calif., and Charles E. Sheetz, Woodstock, Va., assignors to FMC Corporation, San Jose, Calif.

Filed Jan. 20, 1976, Ser. No. 650,814
Int. Cl.[2] B65G 57/09
U.S. Cl. 214—6 F 3 Claims



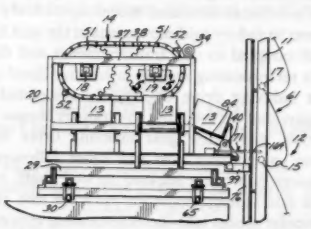
1. An apparatus for stacking or destacking containers comprising frame means, a pair of pivot arms, means rotatably mounting one end of each of said pivot arms to said frame means so that said pivot arms extend in spaced parallel relationship, a first sprocket mounted adjacent said one end of one of said pivot arms and being secured against rotation relative to said frame means, a second sprocket rotatably secured to the other end of said one pivot arm, an endless chain received about said first and second sprockets, container clamping means rotatably secured to said other ends of said pivot arms and being rigidly connected to said second sprocket, means for moving said clamping means apart and together to clamp a container therebetween, means for rotating said pivot arms about the axis of said first sprocket when a container is clamped by said clamping means to transfer said container from one end of the apparatus to the other while the orientation of said container is undisturbed, said means for rotating said pivot arms comprising chains secured to said other ends of said pivot arms, and means constraining said chains to move in parallel arcuate paths at the top of said apparatus.

4,036,376

CARGO TRANSPORT SYSTEM

Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630

Filed Apr. 8, 1976, Ser. No. 675,198
Int. Cl.[2] B65G 67/58
U.S. Cl. 214—14 16 Claims



15. In a cargo transport system for transferring discrete cargo loads from a vessel upon which is mounted a lateral conveyor means for directing movement of discrete cargo loads along a path terminating at a loading station on said vessel to a conveyor tower extending vertically from a cargo terminal to the aforesaid loading station and carrying thereon an endless conveyor means formed with discrete receptacles transversing the length of said tower, so that each of said receptacles sequentially approaches the loading station to receive a cargo load therefrom; the improvement wherein there is provided at said loading station;

a platform transversely oriented with respect to said lateral conveyor means and mounted on said vessel and sloped downward therefrom toward said endless conveyor means for sequentially and passively receiving discrete cargo loads from said lateral conveyor means, and for allowing loads so received to slide toward an approaching receptacle;

powered cargo delivery means for forcing cargo loads onto said sloped platform from said lateral conveyor means;

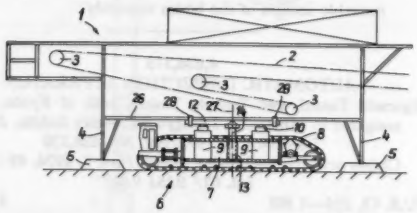
receptacle sensing means for detecting an approaching receptacle in said endless conveyor means for actuating said powered cargo delivery means to effect delivery of a sequential load onto said platform means as aforesaid whereby said cargo load slides from said platform into said approaching receptacle.

4,036,377

DEVICE FOR TRANSPORTING LOADS, ESPECIALLY FOR BELT DRIVING STATIONS IN OPEN PIT MINING

Heinz Weber, Krefeld-Traar, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 27, 1975, Ser. No. 562,487
Claims priority, application Germany, Apr. 5, 1974, 2416642
Int. Cl.[2] B60P 1/02
U.S. Cl. 214—512 6 Claims



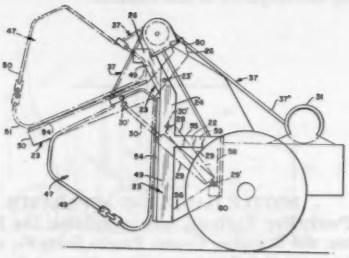
1. A device for lifting and transporting loads, especially for moving belt driving stations in open pit mining, which includes: caterpillar chain carrying means, propelling means associated with said carrying means for propelling same, a pluraity of supporting means comprising in combination fluid operable cylinder-piston means with their axes extending upwardly substantially perpendicularly with regard to said carrying means, lifting plaftform means arranged above said supporting means for selectively supporting a load means associated with at least one of said supporting means and connecting the latter to at least one of said supporting means, and means associated with said lifting platform for permitting independent turning of said lifting platform and said propelling means relative to each other, said means associated with said lifting platform including additional fluid operable cylinder-piston means and latch means interconnecting said lifting platform and said carrying means, said additional fluid operable cylinder-piston means being inclined relative to each other so that the forces generated thereby have components tending to create rotary movements about a common vertical axis, whereby the lift platform can be rotated or when the latch means is actuated the carrying means can be rotated relative to the lifting platform means.

4,036,378

ATTACHMENT TO POLE SKIDDER VEHICLE FOR LOADING, HAULING, AND STACKING CUT LOGS

Leroy D. Luukonen, Box 53, and Arthur E. Tieden, both of Laporte, Minn. 56461

Filed May 20, 1976, Ser. No. 688,252
Int. Cl.[2] B66C *1/42*
U.S. Cl. 214—92 4 Claims



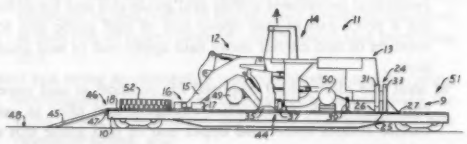
1. An attachment for a pole skidder vehicle for hauling and stacking cut logs comprising a frame adapted to be detachably mounted to the rear of the pole skidder vehicle, said frame having a pair of fixed upright arms, a pivotally mounted movable plate pivotally mounted to the upper end of the fixed arms, hydraulic means to actuate the movement of the plate, a separate length of cable for initially stacking cut logs thereon, a winch cable for the vehicle having a plurality of detachable connections thereon whereby the winch cable may be placed across the top of the stack and connected to the outer ends of the separate length of cable to encircle the stack, a winch on the vehicle, said winch acting to wind the winch cable to draw the initial stack up against the movable plate, whereupon the initial stack of cut logs may be hauled to a stacking location, said movable plate may thereby be actuated to pivot the movable plate and initial stack upward and the vehicle backed up to the end of a row of previously stacked cut logs at the stacked location and at least one of the cable connections detached and the cables wound back by the winch to enable the initial stack to be unloaded at the end of the previously stacked row of cut logs.

4,036,379

SECURING-UNLOADING APPARATUS FOR FLATCAR CARRIED WHEELED VEHICLES

William H. Godfrey, Aurora, and Neal L. Woessner, Montgomery, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 17, 1976, Ser. No. 697,302
Int. Cl.[2] B65G *65/00;* B65D *3/16*
U.S. Cl. 214—152 15 Claims



15. A method for loading, securing, and unloading a wheeled vehicle having a movable lift arm and front and rear wheels on a flatcar having a lift arm means having a pivotally movable supporting element, a holding means, and a tensioning means, comprising:

positioning the wheeled vehicle on the flatcar with the lift arm in contact with the supporting element and the opposed end of the vehicle in contact with the holding means;

connecting the vehicle to the flatcar with a preselected force by a tensioning means;

thereafter releasing the tensioning means;

raising the front wheels in response to lowering the vehicle lift arm in forcible contact with the supporting element;

installing resilient tires on the front wheels of the vehicle;

raising the vehicle lift arm free from contact with the supporting element and supporting the vehicle on the resilient front tires;

pivoting the supporting element to a preselected lower elevation;

raising the rear of the vehicle;

installing resilient tires on the rear wheels of the vehicle; and

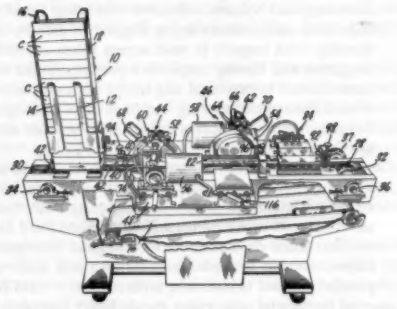
driving the vehicle over the lift arm means and from the flatcar.

4,036,380

APPARATUS FOR OPENING CIGARETTE CARTONS AND PACKS AND REMOVING THE CIGARETTES

R. Arlen Berry, Greensboro, and Albert W. Thompson, McLeansville, both of N.C., assignors to Loews Theatres, Inc., New York, N.Y.

Filed June 15, 1976, Ser. No. 696,362
Int. Cl.[2] B65B *21/02*
U.S. Cl. 214—305 10 Claims



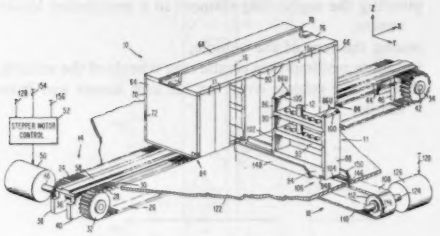
1. Apparatus for opening cigarette cartons and the packs of cigarettes in the cartons and removing the cigarettes from the packs comprising means for conveying the cartons of cigarette packs along a predetermined path with the cigarettes aligned transversely to the axis of the path, means at a first station along the path for removing both side walls of the cartons and both ends of all of the packs in the cartons, means at a second station along the path for directing jets of air in a direction parallel to the axes of the cigarettes and confined substantially to a region traversed by the center row of cigarettes in each pack as the packs move along the path to blow seriatim the cigarettes in the center rows out of the packs, means at a third station along the path for directing divergent jets of air generally parallel to the axes of the cigarettes at regions traversed by the remaining cigarettes not removed from the packs at the second station to blow at least some of the remaining cigarettes out of the packs, and means at the second and third stations for restraining the carton and packs from being blown from the conveying means by the air jets.

4,036,381

APPARATUS FOR TRANSFERRING SAMPLE HOLDERS RELATIVE TO A MOVABLE MAGAZINE

Thomas Christian Nielsen, Endwell, and James Louis Sirico, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,723
Int. Cl.[2] B07C 5/36
U.S. Cl. 214—310 **6 Claims**



1. A sample handling system for storing, conveying and presenting a plurality of sample test tube containers to at least one work station, said system comprising:

a plurality of substantially identical sample container holders, each of said sample container holders carrying a plural number of said sample containers in a predetermined linear array and in an upright manner,

at least one six-sided box-like magazine for carrying therein a plural number of said holders, said magazine having top and bottom horizontal closed first and second sides, respectively, two parallel vertical closed third and fourth sides, a vertical closed fifth side extended between said first and second sids and between said third and fourth sides, and a sixth open side configured as an access for accessing said holders, said sixth side being parallel to said fifth side, said holders being aligned in side-by-side relationship with respect to said access when carried by said magazine and having respective predetermined edge portions thereof in proximal alignment with said access, each of said linear arrays being disposed in an orthogonal relationship with said access when said holders are in said side-by-side relationship,

first horizontal conveying means for moving said magazine along a first horizontal path, said magazine being conveyed with its bottom side in contacting relationship with said first conveying means and havings its third and fourth vertical sides on a transversely aligned orientation with respect to said first path and its fifth and sixth sides in a parallel aligned orientation with respect to said first path,

second horizontal conveying means being operable to selectively and incrementably move said holders along a second horizontal path, said second conveying means intersecting said first path at a predetermined location thereof, and said second conveying means extending adjacent to at least said one work station, said first conveyor means being operable to selectively and incrementably position said magazine at said location, and

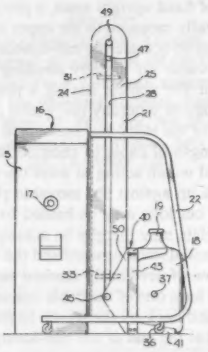
holder transfer means for transferring at said location said holders through said access relative to the interior of said magazine and to said second conveyor means, said holder transfer means having a protruding member means movable along said second path by said second conveyor means, each of said holders having a cooperative member means disposed in the respective said edge portions thereof and engageable by said protruding member means, said holders when carried by said magazine having their respective cooperative members means in substantial alignment, said bottom second and vertical third and fourth sides of said magazine having aligned recesses to expose said aligned cooperative member means when carrying said holders therein, and said protruding member means having an at rest home position at said location at which the protruding member means is in protruding alignment with said aligned cooperative member means, said recesses of said magazine and said cooperative member means of said holders providing a non-obstructing relationship with said protruding member means whenever said protruding member means is in said home position and said first conveyor means is operably incrementing said magazine at said location.

4,036,382

BOTTLE HANDLING APPARATUS

Eric Perry; Roy T. Heath, both of Arcadia; Lee F. Rost, La Verne, and Braughler Cowan, Rancho Santa Fe, all of Calif., assignors to C & P Industries, Inc., Newport Beach, Calif.

Filed Sept. 15, 1975, Ser. No. 613,615
Int. Cl.[2] B65B 21/02
U.S. Cl. 214—313 **11 Claims**



1. An apparatus for vertically moving a container and for rotating such container into an inverted position comprising:

at least one generally vertical rail having a first edge and a second edge, and a generally vertical guide slot disposed between said first and second edges, said guide slot having an upper end adjacent to the upper end of said rail said first and second edges and said guide slot lie in a common vertical plane,

a carrier for receiving such container, said carrier including guide means for cooperatively engaging said guide slot for reciprocal movement within said guide slot and for defining a pivot axis at said upper end of said guide slot for rotation of said carrier about said upper end of said guide slot;

at least one idler wheel disposed for rotation at said upper end of said rail, said carrier engaging said idler as said carrier rotates about said upper end of said guide slot at said pivot axis;

drive means coupled to said carrier for upwardly moving said carrier along said first edge of said first rail, for rotating said carrier about said upper end of said guide slot in engagement with said idler wheel and for downwardly moving said carrier in an inverted position along said second edge of said rail;

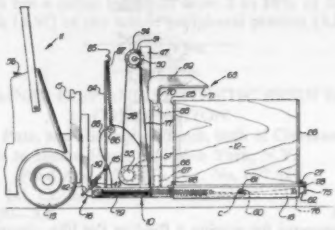
whereby said carrier and container may be raised along said first edge of said rail, rotated to an inverted position and then lowered along said second edge of said rail.

4,036,383

FORK LIFT TRUCK TOTE BOX DUMPER

Curtiss B. Allen, 190 Terracina, Redlands, Calif. 92373

Filed Mar. 19, 1976, Ser. No. 668,578
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—313 6 Claims



1. The combination of:

frame means impalable horizontally upon the prongs of a fork pick-up truck and insertible, when supported as so impaled upon said prongs, into suitable horizontal openings provided therefor in the bottom of a tote box;

a box cradle pivotally mounted on a low transverse axis on the forward end of said frame means and extending therebeyond, said cradle including a flat cradle base which is normally in co-planar relation with said frame means when the latter is inserted into said horizontal box openings whereby said cradle base is also inserted into said box openings so as to underlie said box;

means on said cradle preventing said box falling from said cradle when the latter is rotated to invert said box;

means mounted on said frame means and controlled from the driver's seat of said fork lift truck for power rotating said cradle to first dump the contents from said box, while retaining said box confined within said cradle, and then reversibly rotating said cradle thereby returning said cradle base to its co-planar relation with said frame means permitting said box to be set down right side up on the ground and said frame means and cradle base withdrawn from the bottom openings in said box, by manipulating said fork lift truck with said frame means impaled thereon,

said cradle including a rear box limit stop fixed on said cradle base and an upper box limit stop fixed on said rear box limit stop, which stops join with said cradle base to provide fixed barriers limiting movement of said box with reference to said cradle in any of three directions dispersed at intervals of ninety degrees readily about said transverse axis;

said box being an element of said combination and including horizontally forwardly extending flange means along the front lower edge thereof just above said horizontal box openings herein; and

a forward box limit stop means on the front edge of said cradle base and extending upwardly therefrom to be interposed in front of said box when said frame means and cradle base have been fully inserted into said box bottom openings and then lifted into supporting relation with said box,

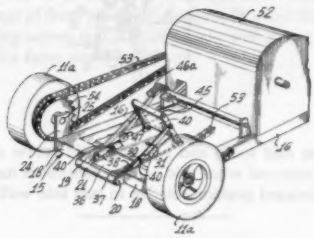
said forward box limit stop means being shaped to interlock with said flange means thereby securely retaining said box in said cradle while the contents are being dumped therefrom.

4,036,384

TRUCK FOR TRANSPORT OF AIRPLANE BY ITS NOSE LANDING WHEEL

Philip L. Johnson, 705 Vesta St., Inglewood, Calif. 90302

Filed July 16, 1976, Ser. No. 705,948
Int. Cl.[2] B60B *29/00*
U.S. Cl. 214—334 6 Claims



6. A truck for elevating and trapping the pneumatically tired nose carriage wheel of an airplane, and for subsequently transporting the airplane over the ground surface by said wheel, comprising:

a truck frame;

two front wheels and at least one rear wheel for said frame;

a horizontal pick-up roller mounted for rotation on a transverse axis on the front end of the said frame, with the underside thereof spaced above the ground surface, said roller being engageable upwardly and forwardly with the tire of the nose wheel of the airplane in front of the point of engagement of the nose wheel with the ground surface;

a turntable mounted for rotation on a vertical axis on said frame, said turntable being spaced generally rearwardly of the axis of said front wheels, and being spaced above the ground surface at a level generally coordinated with the height of the topside of said pick-up roller above ground surface;

a gate pivotally mounted on the normally front side of said turntable on a horizontal axis transverse of said frame, said gate being pivotally movable between an initial forward downwardly swung position, in which it acts as a bridge between said pick-up roller and the normally front edge of the turntable, and an upwardly swung second position in which it forms a barrier behind the airplane nose wheel;

a rearward barrier for said wheel on the normally rearward side of the turntable; and

means responsive to relative translation of said turntable and nose wheel into a centered position of the nose wheel on the turntable for elevating said barrier into said upwardly swung second position.

4,036,385

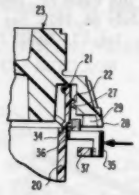
SAFETY CLOSURE FOR CONTAINERS

Glenn H. Morris, 4203 Highwood Drive, Chattanooga, Tenn. 37415

Filed May 28, 1976, Ser. No. 690,962
Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—209 14 Claims

1. In a container, a body portion having a threaded mouth, a screw closure for the container rotationally engageable with the threaded mouth and having a circumferentially extending group of locking teeth, and a release element on the side wall of said body portion having a part adapted to interlock with a tooth of said screw closure when the screw closure is applied to said threaded mouth of said body portion, said release element including a circumferentially extending spring-like bendable element spaced radially outwardly from the container side wall, a radially extending arm connecting an end of the release element to the container side wall, said release element movable laterally toward and away from said side wall and said part interlocking with said tooth and preventing rotational

removal of said screw closure when the release element is in an outward position relative to said side wall, and said part separating from said tooth and releasing said screw closure for rotational removal when said release element is moved laterally to an inward position relative to said side wall.

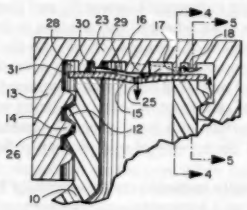


4,036,386

VENTING CLOSURE ASSEMBLY

Masato Nishioka, and Daniel Dulaney Carter, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 14, 1976, Ser. No. 696,145
Claims priority, application Philippines, July 9, 1975, 17362
Int. Cl.[2] B65D *51/16*
U.S. Cl. 215—260 **3 Claims**



1. A venting closure comprising a cap and resilient gasket adapted for use on a threaded neck container including a threaded outer wall, an inner wall, and an interconnecting rim;

wherein said cap has a top wall; a cylindrical skirt depending from said top wall having thread means for engaging the threaded outer wall of the container neck; a plurality of staggered circumferential flanges, concentric with said skirt, depending downwardly from the top wall of said cap, adapted to be oppositely disposed to the rim of said container neck; and a central boss depending downwardly from the top of said cap;

wherein each of said flanges has a full depth portion and a tapered portion in generally helical form, the pitch of which at every point is equal to or less than the pitch of the threads and is in the same direction; wherein at least one flange is adapted to be oppositely disposed to substantially the entire periphery of the rim of said container neck; and wherein the tapered portions when the cap is seated against the gasket form an interconnected open channel permitting tranverse air flow completely across said plurality of flanges;

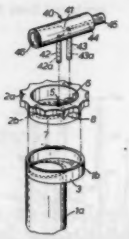
and wherein said gasket when seated is in supporting engagement between the full depth portions of said flanges and the rim of said container neck; said gasket having a skirt/gasket clearance around at least some portions of its periphery, and a centrally located hole around the periphery of which the gasket is in sealing engagement with said boss; said gasket being adapted to flex under the influence of an externally applied pressure differential to permit the passage of air from the atmosphere into said container.

4,036,387

PREPARING BLOOD AND LIKE SAMPLES

William Wardock Feaster, L'Estoril, Princesse Grace Avenue, Monte Carlo, Monaco

Filed Nov. 25, 1975, Ser. No. 635,212
Int. Cl.[2] B65D *51/16*
U.S. Cl. 215—309 **16 Claims**



1. Apparatus for storing a fluid or the like, comprising

a. a container having first and secnd portions, and means defining a sealing surface at the junction between said first and second container portions, and

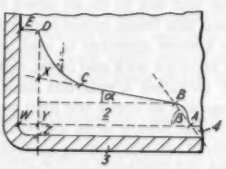
b. a closure member mounted in said first container portion, said closure member containing at least one passageway for the fow of fluid to and from said second container portion, respectively, said closure member being movable relative to said container between closed and opened positions in which said passageway is sealed from and is in communication with said second container portion, respectively.

4,036,388

SEALING GASKETS FOR CONTAINER CLOSURES

James John Alexander Davidson, St. Neots, England, assignor to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 580,199, May 23, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,901
Claims priority, application United Kingdom, May 28, 1974, 23611/74
Int. Cl.[2] B65D *53/00, 53/04*
U.S. Cl. 215—341 **3 Claims**



1. A roll-on cap blank destined to closing and sealing a bottle, which comprises an end panel, a depending peripheral skirt and a liner affixed to said end panel, said liner having (a) a flat central panel occupying from 50 to 94% of the internal radius of the cap blank and (b) an adjoining peripheral portion occupying the remaining 6 to 50% of the radius, the configuration of the peripheral portion being as follows, namely; considering the cap blank in an up-turned position relative to that which the cap occupies on the container and considering the peripheral portion in a radially outward direction, it comprises consecutively:

i. a first part (AB) of relatively steep gradient upwards from the edge of the central panel which makes an angle (β) with the plane of the central panel of from 25 to 90° and which has a radial length of from 5 to 30% of the radial length (AW) of the whole peripheral portion (AE);

ii. an adjoining relatively flat step part (BC) of constant gradient which makes an angle (α) with the plane of the central panel of from 0 to 25° and which has a radial length of from 10 to 70% of the radial length (AW) of the whole peripheral portion (AE);

iii. an adjoining corner part (CD) sloping upwardly, the height (DX) of which above the plane of the step part is from 20 to 65% of the height (DY) of the top of the corner part above the plane of the central panel, and

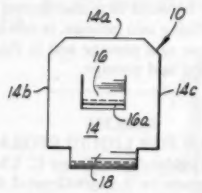
iv. an adjoining final marginal part (DE) which extends to the skirt at a level not below that of the corner part and which has a radial length of from 2 to 15% of the radial length (AW) of the whole peripheral portion (AE).

4,036,389

RETAINER CLIP AND SYNTHETIC RESIN BOX COMBINATION

Harold T. Pate, and Richard J. Borsh, both of Cleveland, Ohio, assignors to Indian Head Inc., New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,555
Int. Cl.[2] H02G 3/14; F16B 19/00, 37/02
U.S. Cl. 220—3.8 **5 Claims**



1. A spring metal fastener of generally V-shaped configuration comprising:

a first flat, substantially monoplanar leg having a first end edge and two side edges, each side edge intersecting a line coincident with said end edge, said side edges being free edges;

a second flat, substantially monoplanar leg having an opening formed therethrough and disposed centrally therein;

a bend portion joining one end of said first leg to one end of said second leg and reverse bent through an angle of from about 132° to about 137° to define an acute angle between said first and second legs of from about 43° to about 48°; and

a tongue pressed out of the central portion of said first leg and projecting in a plane which extends toward said second leg at an angle to the plane of said first leg, said tongue projecting a distance from the plane of said first leg, as measured normal to that plane, which is from about one-half to about two-thirds of the total distance of projection of said bend portion from the plane of said first leg, also as measured to the plane of said first leg.

3. In combination,

a synthetic resin box having wall means defining a hollow interior and defining an opening at one side of said box, said wall means defining a slot adjacent said opening at one side of box and further defining an elongated screw passage way having an axis extending parallel to said slot, a portion of said wall means separating said slot from said passageway; and

a spring metal fastener mounted in said wall means and including:

a first flat, substantially monoplanar leg having a first end edge of two side edges, each side edge intersecting a line coincident with said end edge, said side edges being free edges; said first leg being positioned in said slot with the plane thereof extending substantially parallel to the axis of said elongated screw passageway, and with one flat side first leg bearing against one side of said slot;

a tongue pressed out of said first leg at an acute angle to the plane thereof and resiliently bearing against the second side of said slot;

a second flat, substantially monoplanar leg having a central opening therethrough, which opening has its center aligned with the axis of said elongated screw passageway; and

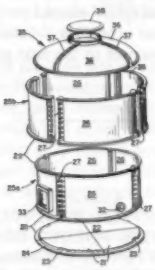
a bend portion joining one end of said first leg to one end of said second leg and reverse bent through an angle of from about 132° to about 137° to define an acute angle between said legs of from about 43° to about 48°, said bend portion bridging across said portion of said wall means separating said slot from said passageway.

4,036,390

PLASTIC TANK PANELS AND JOINT ASSEMBLY

Dwain E. Morse, Ventura County, Calif., assignor to Morse California Co., Fillmore, Calif.

Filed Oct. 17, 1975, Ser. No. 623,316
Int. Cl.[2] B65D 7/02, 7/42
U.S. Cl. 220—5 A **42 Claims**



1. A modular-construction tank comprising:

A. a base; and

B. a ring module which fits sealably upon said base, comprising, in combination:

1. a plurality of curved wall panels which are principally made from a thin-walled material, each comprising:
   a. a main wall section,
   b. a strap assembly, and
   c. a recurved wall section which is disposed along each vertical side of said main wall section, said recurred wall section comprising:
      1. an inwardly disposed diagonal which extends from said main wall section along a first partial bend;
      2. a circumferentially disposed strip which extends from said diagonal along a second partial bend; and
      3. a radially disposed and outwardly extending flange which extends out of said strip along a right-angled bend; and

2. a plurality of butt joints, each comprising:
   a. a pair of said strap assemblies,
   b. a pair of said recurved wall sections, and
   c. an interconnecting means for conjoining and circumferentially compressing said wall panels across said butt joint to form said ring module,

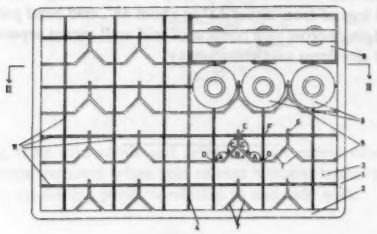
whereby hydrostatic pressure causes said strap assemblies and said interconnecting means to be in tension from hoop stress and said recurved wall sections to be free of tension.

4,036,391

PLASTIC BOTTLE CASE

Ulrich Prodel, Bad Salzuflen BRD, Germany, assignor to Spumalit-Anstalt, Liechtenstein

Filed Oct. 22, 1976, Ser. No. 734,741
Claims priority, application Germany, Oct. 25, 1975, 2547830
Int. Cl.[2] B65D *1/24, 75/00, 85/00*
U.S. Cl. 220—21 5 Claims



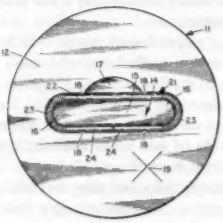
1. Plastic bottle case comprising four side walls, a bottom, and a plurality of partitions extending between only two opposite side walls, said partitions having spaced V-shaped laterally projecting portions and a projection extending parallel to said opposite side walls from the apex of each of said V-shaped portions, said partitions and said projections being spaced apart a distance slightly greater than the diameter of bottles to be received in said case and said V-shaped projection portions and said projections together extending a distance greater than the radius of said bottles but not to the next partition.

4,036,392

DISPOSABLE BEVERAGE CONTAINER COVER ELEMENT CARRYING FOLDED DRINKING STRAW

Marvin C. Martin, 520 Peren Ave., Chesapeake, Va. 23320

Filed Nov. 1, 1976, Ser. No. 737,407
Int. Cl.[2] B65D *1/24, 1/36, 57/00*
U.S. Cl. 220—23 7 Claims



1. A disposable cover element for a disposable beverage container, comprising:

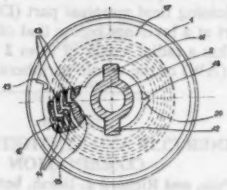
a section adapted to close the upper opening of said beverage container having a recess formed in the exterior surface thereof, said recess being adapted to receive a folded drinking straw having a straight central length extending between two transversely corrugated lengths each of which is bent into a halfloop configuration and further having at least one straight terminal length, said section of said cover element carrying a plurality of projecting portions extending into said recess over an appreciable portion of the depth thereof for readily removably securing said folded drinking straw in said recess.

4,036,393

CAP FOR A FUEL TANK

Michel Neiman, Paris, France, assignor to Societe de Diffusion Neiman, Courbevoie, France

Filed June 10, 1976, Ser. No. 694,760
Claims priority, application France, July 24, 1975, 75.23081
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—206 9 Claims



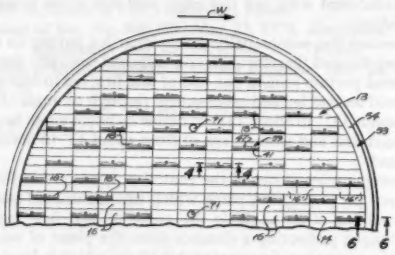
1. A cap for a fuel tank comprising a closure element having an inside surface which in use faces towards the interior of the tank, means defining a labyrinthine venting passage on said inside surface, said passage having exit and entrance ends, and plug means movable between first and second positions relative to said means defining said passage, in one of said positions being effective to close said passage and in the other position being effective to open said passage.

4,036,394

FLOATING ROOF FOR LIQUID STORAGE TANKS

Robert W. Bodley, Highland, and Reign C. Ulm, Schererville, both of Ind., assignors to Aerojet-General Corporation, El Monte, Calif.

Continuation of Ser. No. 342,454, March 19, 1973, abandoned.
This application Aug. 11, 1975, Ser. No. 603,844
Int. Cl.[2] B65D *87/20*
U.S. Cl. 220—222 16 Claims



1. A floating roof for a liquid storage tank comprising a single-deck lid of a plurality of fluid-tight interconnected rectangular steel plates and auxiliary means for imparting buoyancy to the lid including a plurality of elongate buoys of low silhuouette on the upper surface of the lid, each buoy having as its base one of the plates and having longitudinal sides inclined toward each other and the base, such that tht the buoy is of increasingly smaller horizontal section from its base to its top and of such construction as to stiffen the junctions between the buoy and adjacent plates.

16. A method of minimizing fatigue cracking due to wind action upon a floating roof for a liquid storage tank of the type wherein the floating roof comprises a lid formed by the interconnection of a plurality of fluid tight plates by welding or the like, said roof having a plurality of buoy means arranged upon the upper surface of the roof to provide floating support of the roof in the event of deck puncture or precipitation loading, comprising the steps of:

constructing each of said plurality of buoys to have a base

consisting substantially of a different one of said plurality of plates forming said lid, and further including structure attached to said base upon said deck lid to form a closed buoy of increasingly smaller horizontal section from the base to the top of said buoys, each of said buoys having a length greater than its width, and a width greater than its height to effect a relatively long and low buoy silhouette and impart stiffening to the interconnection junctions paralleling the longest dimension of said buoy between each buoy base plate and its adjacent plate, and

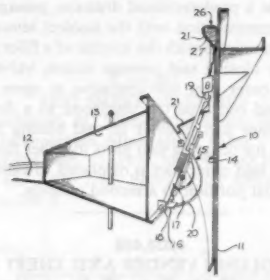
orienting said lid structure within said storage tank with the lower surface thereof adapted to contact the top surface of said liquid contents in an essentially flat contacting relationship and with the longest dimension of each of said plurality of buoys being essentially parallel to the prevailing wind direction at the site of the storage tank.

4,036,395

SECONDARY SEALING DEVICE FOR STORAGE VESSEL HAVING A FLOATING ROOF

James C. Tuckey, Hacienda Heights, Calif., assignor to Pacific Erectors Corporation, Sante Fe Springs, Calif.

Filed June 4, 1976, Ser. No. 692,750
Int. Cl.² B65D *87/207*
U.S. Cl. 220—224 **3 Claims**



1. In a liquid storage vessel which includes a cylindrical tank and a circular floating roof and which has a primary sealing structure that includes:

a. a pontoon mechanically coupled to the floating roof and disposed about its perimeter;

b. a set of hangers, each of the hangers having a first end and a second end with the first end being mechanically coupled to the pontoon so that the hanger may pivot about its first end;

c. a set of sealing shoes, each of which is disposed about the perimeter of the floating roof and adjacent to the sidewall of the cylindrical tank so that it contacts it and each of which is mechanically coupled to the second end of one of the hangers;

d. a set of metal bands, each of which is mechanically coupled to one of the hangers;

e. a set of counterweights, each of which is mechanically coupled to one of the metal bands so that it exerts a downward force on the hangers; and

f. a fabric sealing material disposed about the perimeter of the floating roof and secured thereto on one its sides in a gas-tight manner and mounted adjacent to the sealing shoes in the combination with a secondary sealing device comprising, said secondary sealing device:

a. a support member of an inelastic material having a substantially rectangular cross-section and being of a particular length, said support member being mechanically coupled to the sealing shoe so that the fabric sealing material may contact the inner sidewall of the cylindrical tank;

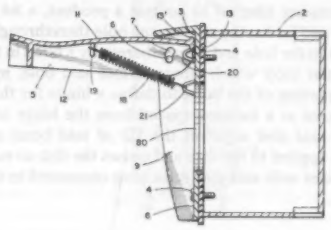
b. an elongated inner core member of elastic material having substantially a rectangular cross-section and being the same length as said support member, said core member being secured to said support member and adapted so that the fabric sealing material may be looped over said core member and secured on both sides of the loop to said support member.

4,036,396

WEATHERPROOF JUNCTION BOX COVER ASSEMBLY

Richard T. Kennedy, Oaklawn; Algird R. Quitschau, Downers Grove, and Ernest S. Kettelson, Joliet, all of Ill., assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 14, 1975, Ser. No. 621,906
Int. Cl.² H02G *3/18*
U.S. Cl. 220—242 **2 Claims**



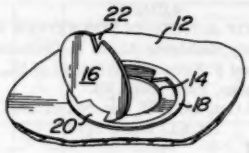
1. A weatherproof junction box cover assembly, comprising a structural member for mounting relationship with a junction box, a cover member, pivot means associated with said members to hingedly mount said cover member on said structural member, a cooperative inter-related hood associated with said structural member and said cover member, shiftable bias means operably mounted on said assembly to normally bias said cover toward a closing position, said shiftable bias means being shiftable with respect to such members to vary the operative effect of said bias means, wherein said shiftable biasing means includes a spring to normally bias said cover toward a closing position, said spring including shiftable interconnecting means to shift the operation of said cover from a first mode to a second mode, mounting means on said cover assembly, said shiftable interconnecting means being shiftably connectable to said mounting means of said assembly, said mounting means including first mounting means having first and second connecting stations positioned on one of said members for connection of said shiftable interconnecting means of said spring thereto and dis-connection therefrom, said first connecting station being spaced apart from said second connecting station on said one of said members, a second interconnecting means of said spring located oppositely of said shiftable interconnecting means, second mounting means of said assembly on the other of said members spaced apart from said first mounting means in the direction said cover member moves when opening, said second interconnecting means of said spring being connectible to said second mounting means, said shiftable interconnecting means including a first end providing means for connection to and disconnection from said first mounting means, said pivot means defining a pivotal axis directed perpendicular to the direction of opening and closing of said cover member and located intermediately of said first and second mounting means, a straight line between said first mounting means and said second mounting means lying on a first side of said pivotal axis when said cover member is in the fully open position, a straight line between said second pair of lugs of said first mounting means and said second mounting means lying on an opposite second side of said pivotal axis when said cover member is in the fully open position.

4,036,397

CONTAINER WITH EASY OPEN TOP

Thomas A. Walraven, West Chester; John G. Thomas, Berwyn, and James B. Hall, Chester Springs, all of Pa., assignors to Christiana Metals Corporation, West Chester, Pa.

Filed Sept. 7, 1976, Ser. No. 720,533
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—268 8 Claims



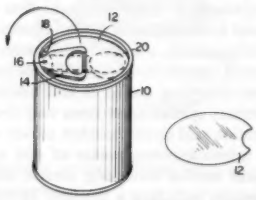
1. A container adapted to contain a product, a lid for said container, said lid having at least one hole therethrough, a disk juxtaposed to the hole and joined thereto by a bond in the form of an annular loop which circumscribes said hole, means including a portion of the bond to define a hinge for the disk, a stress director at a location spaced from the hinge to initiate tearing of said disk adjacent the ID of said bond as finger pressure is applied to the disk and causes the disk to move into said container with said disk remaining connected to the lid at said hinge.

4,036,398

CONTAINER WITH REMOVABLE RING AND UTENSIL CARRYING LID

Roy Hoogvelt, and Jack Hoogvelt, both of Eagle Rock, Calif., assignors to The Raymond Lee Organization, Inc., a part interest

Filed Aug. 31, 1976, Ser. No. 719,174
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 2 Claims



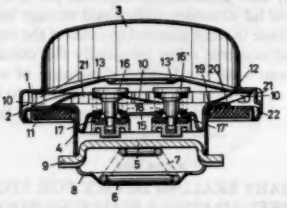
1. In combination with a container having a removable lid, said lid having outer and inner surfaces and being peripherally sealed to the container: a pull ring secured to the outer surface of the lid in a selected region, the periphery of said region being weakened whereby the ring and said region can be readily separated as a unit from the remainder of the lid; and a disposable eating utensil secured removably to the inner surface of the lid, said utensil having a handle, said handle being secured to said region whereby the ring, region and utensil form a removable unit.

4,036,399

GAS CAP WITH AUTOMATIC PRESSURE COMPENSATION

Theodor Gerdes, Langenfeld, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Germany

Filed Sept. 1, 1976, Ser. No. 719,413
Claims priority, application Germany, Sept. 4, 1975, 2539320
Int. Cl.[2] B65D *51/16, 45/00, 83/10*
U.S. Cl. 220—303 11 Claims



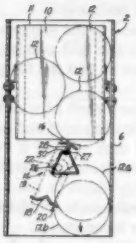
1. A gas cap, particularly for filler pipes of motor vehicles, comprising an inner part having bayonet- portions for engagement with corresponding portions of a filler pipe; an outer part mounted on said inner part freely rotatable relative thereto; biasing means biasing said parts away from one another so as to maintain them at a predetermined distance; passage means in said parts in communication with the ambient atmosphere and adapted to communicate with the interior of a filler pipe; valve means normally closing said passage means; valve actuating means on said outer part and operative to open said valve means when said outer part is displaced to a first position towards said inner part counter to said biasing means; and coupling means for coupling said parts together for joint rotation only when said outer part is displaced toward said inner part past said first portion to a second position.

4,036,400

TANDEM COLUMN VENDER ANTI THEFT DEVICE

Kenneth W. Oden, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ranson, W. Va.

Filed Aug. 5, 1976, Ser. No. 711,828
Int. Cl.[2] G07F *11/08*
U.S. Cl. 221—67 6 Claims



1. In a vending apparatus having means, including a planar side wall, defining a compartment for containing and confining at least two columns of generally cylindrical articles with articles of one column axially displaced from the articles of the other column in a front to rear direction, a longitudinally extending lower bail extending below both columns in supporting relation to at least the bottom articles thereof and being swingable about a fore-and-aft axis for lateral movement from a first position supporting said articles to a terminal position wherein all portions thereof are sufficiently spaced from one side wall to permit downward passage of said articles therebetween, said bail having a laterally extending portion below only one of said columns extending farther toward said side

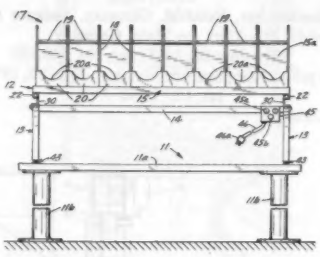
wall than the remainder of said bail whereby said bail may be moved laterally away from said side wall to permit the bottom article of the other column to drop therepast while said laterally extending portion supports the bottom article of said one column and further lateral movement of said bail to said terminal position then permits said bottom article of said one column to drop therepast, an upper bail in rigidly fixed relation to said lower bail and swingable therewith and arranged to swing into supporting engagement with those articles of said columns above said bottom articles in response to swinging movement of said lower bail away from said first position; the improvement comprising:

a member freely swingable and pendulously suspended from said upper bail, intermediate the ends thereof, to hang in said other column, adjacent said one column, in position to block movement of an article supported by said alterally extending portion into said other column when the bottom article of said other column has dropped past said lower bail.

4,036,401
HOT SHELF ASSEMBLY

Walter E. Nachtigall, Jr., Minnetonka, Minn., assignor to Palm Brothers, Incorporated, Minneapolis, Minn.

Filed Sept. 15, 1975, Ser. No. 613,259
Int. Cl.[2] A47F *1/00*; B65G *60/00*; H05B *1/00*
U.S. Cl. 221—150 A 14 Claims

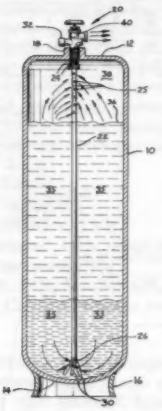


1. A dispensing device comprising: a base having a generally therebetween, facing object supporting surface, a support for positioning the base at an elevation, means movably mounting said base on the support, said base being tiltable from a horizontal position to at least one inclined position, said mounting means including first connecting means secured to the base and second connecting means secured to the support, pivot means pivotally connecting the first connecting means with the second connecting means and lock means for holding the first and second connecting means in at least one selected relative position, means for holding at least one object on the top of said base when in said inclined position, said holding means including one chute, said chute including spaced apart side walls for confining said object therebetweem, there being no object supporting surface forming a part of said chute throughout the majority of the length of said side walls, stop means at one end of said chute for preventing said object from escaping from said chute under the influence of gravity, and means carried by said chute and adapted to engage said base to maintain said chute in the desired operative position on said base, and means mounted in said base for varying the temperature thereof.

4,036,402
INDUSTRIAL FUEL STORAGE AND SELF-BLENDING TANK AND METHOD

Otis Max Taylor, East Point, Ga., assignor to TMC, Inc., Dunwoody, Ga.

Filed July 22, 1976, Ser. No. 707,519
Int. Cl.[2] B67B *7/24*
U.S. Cl. 222—1 6 Claims



1. An industrial fuel storage and self-blending tank comprising: a container having a top, a bottom and sides adapted to be filled with a plurality of liquids of diverse specific gravities to a maximum liquid fill level located below said top thereby providing a vapor chamber between at least said maximum liquid fill level and said top; an outlet adjacent said container top through which vapors may controllably exit the vapor space and enclosed chamber; a dip tube mounted within said container extending from adjacent said container bottom to said container outlet and having a top portion extending upwardly from said maximum liquid fill level through said vapor space to said outlet, a bottom portion located adjacent said container bottom, and an intermediate portion extending between said bottom and top dip tube portions, said dip tube intermediate portion being impervious to the flow of liquid between the interior and exterior thereof, said dip tube bottom portion having a lower tube opening therein through which liquid may flow from the exterior to the interior thereof, and said dip tube top portion having an upper tube opening therein through which gases may flow from the exterior to the interior thereof; a wick mounted within said dip tube overlaying at least a portion of said upper tube opening; and valve means for controlling the flow of gases through said container outlet.

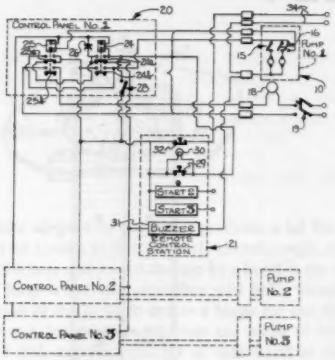
5. A method of storing and self-blending a mixture of fuels of diverse specific gravities comprising the steps of:

a. partially filling a container with the fuels in their liquid state leaving a vapor space above the surface thereof;
b. sealing the container;
c. storing the sealed container thereby permitting the fuel of greater specific gravity to gravitate to the bottom of the container and the fuel of lesser specific gravity to rise thereabove to the surface;
d. drawing liquid fuel of greater specific gravity from adjacent the bottom of the container upwardly by wicking action from adjacent the bottom of the container through and out of contact with the fuel of lesser density into the wick disposed in the vapor space above the surface of the liquid fuel; and
e. drawing vapors of the fuel of lesser specific gravity evaporated from the surface of the liquid fuels out of the container through the liquid fuel of greater specific gravity in the wick within the vapor space.

4,036,403
FUEL DISPENSING ARRANGEMENT

Gerald O. Barnes, 6616 Plank Road, Charlotte, N.C. 28216, and Charles E. Horne, 1241 Cheshire Ave., Charlotte, N.C. 28208

Filed Oct. 22, 1975, Ser. No. 624,533
Int. Cl.[2] B67D 5/22
U.S. Cl. 222—23 8 Claims



1. In a fuel dispensing arrangement having dispenser means with electrically driven pump means for delivering fuel, control means located remotely from said dispenser means and operable by a supervisor for selectively enabling fuel delivery from said dispenser means; and relay means having contacts switchable among a plurality of conditions, said relay means being connected with said control means for responding thereto by switching to a first condition in which contacts are connected to enable energization of said pump means in preparation for fuel delivery from said dispenser means and connected with said dispenser means for responding thereto by switching to a second condition in which contacts are connected for energizing said pump means for delivering fuel from said dispenser means and to a third condition in which contacts are connected for de-energizing said pump means on termination of fuel delivery from said dispenser means and for precluding energization of said pump means until said relay means are returned to said first condition by operation of said control means; the improvement comprising warning means located at said control means and operatively connected with said relay means for signaling to a supervisor that said relay means is in said third condition whereby the attention of the supervisor is directed to the termination of fuel delivery from said dispenser means.

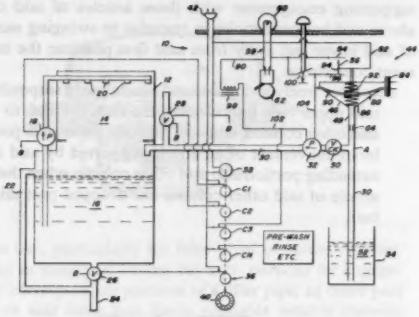
4,036,404
MEANS FOR INDICATING DISHWASHER ADDITIVE ABSENCE

James D. Robinson, Memphis, Tenn., assignor to Auto-Chlor System, Memphis, Tenn.

Filed May 7, 1976, Ser. No. 684,006
Int. Cl.[2] B67D 5/32, 5/14
U.S. Cl. 222—39 6 Claims

1. In a dishwashing machine comprising a reservoir for containing an additive, a supply line connecting the reservoir to a point within the dishwashing machine where the additive is normally added, a pumping means in the supply line for pumping the additive from the reservoir to said point, the pumping means including a check-valve means for retaining the additive in the supply line when the pumping means is not pumping, and control means for controlling the pumping means, the improvement which comprises:

a vacuum operated switch and a connecting line connecting the vacuum operated switch to the supply line between the reservoir and the pumping means, the pumping means, switch and connecting line being physically located above the maximum possible level of additive in the reservoir, the vacuum operated switch comprising at least one pair of electrical contacts, a chamber opening only to the connecting line, one wall of the chamber defining a diaphragm moveable with respect to the remaining portion of the chamber, biasing means for biasing the position of the diaphragm to a preselected position, adjusting means for adjusting the biasing means and connector means for

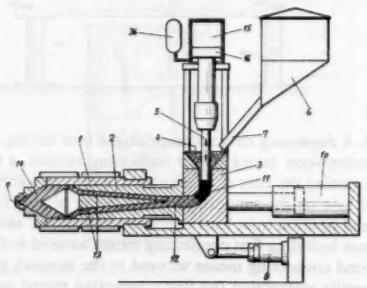


connecting the diaphragm to a moveable portion of the at least one pair of electrical contacts, the adjusting means being adjusted such that the weight of the additive in the supply line between the connecting line and the reservoir is sufficient, when present, to create a vacuum within the chamber sufficient to operate the switch against the biasing means.

4,036,405
INJECTION MOLDING MACHINE WITH FEED CONTROL

Ingolf Mombächer, Reinfeld, Germany, assignor to Braas & Co. GmbH, Frankfurt am Main, Germany

Filed Jan. 24, 1975, Ser. No. 543,959
Claims priority, application Germany, Nov. 19, 1973, 2357583
Int. Cl.[2] B29F 1/06
U.S. Cl. 222—63 4 Claims



1. An injection molding machine for plastic material comprising an axially elongated injection cylinder, an axially extending displaceable element mounted in said injection cylinder with the axis of said displaceable element extending in the same direction as the axis of said injection cylinder, said displaceable element having an axially extending bore therethrough, one of said injection cylinder and displaceable element being axially movable relative to the other, said injection cylinder and displaceable element each having a first end and a second end with the first ends of each facing in the same direction and the second ends facing in the opposite direction from the first end, an injection nozzle positioned on the first

end of said injection cylinder, a feed device located adjacent the second ends of said injection cylinder and displaceable element, said feed device including a feed hopper and a plunger reciprocally mounted in said feed hopper, means for conveying plastic material from said feed hopper into the bore at the second end of said displaceable element, pressure means in operative communication with said plunger for driving the reciprocating movement of said plunger, first switch means and second switch means spaced apart in the direction of the reciprocating movement of said plunger for reversing the movement thereof, said first and second switch means disposed in communication with said pressure means, said first and second switch means being selectively and separately positionable along the reciprocal path of movement of said plunger so that said first switch means defines the extent to which said plunger is inserted into said feed hopper and establishes the inserted position of said plunger and said second switch means defines the extent to which said plunger is retracted out of said feed hopper and establishes the retracted position of said plunger, and said pressure means including a device for retaining said plunger in the inserted position when a sufficient amount of plastic material has been supplied into the bore in said displaceable element for effecting the injection molding operation.

4,036,406

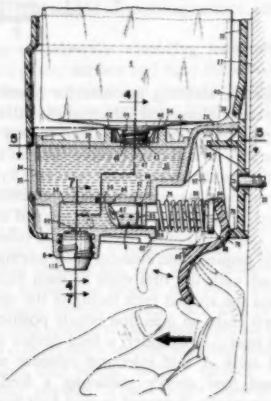
DISPENSER FOR LIQUIDS

Paul W. Jespersen, and Raymond F. DeLuca, both of Stamford, Conn., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Continuation of Ser. No. 476,000, June 3, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 674,928

Int. Cl.[2] G01F *11/06*

U.S. Cl. 222—181 **34 Claims**



1. A dispenser for liquids comprising:

a supporting chassis;

a supply tank mounted on said chassis for storing a quantity of a liquid;

a pump mounted on said chassis and communicating with said supply tank for pumping the liquid out of the dispenser; and

a nozzle mounted on said chassis and communicating with said pump for conveying the liquid out of the dispenser, said nozzle including a housing member having an internal passage extending therethrough, an insert mounted within said housing member passage, said insert having a pair of generally opposed ends and sides extending between said ends, said insert further having a passage extending from an opening in one of said ends thereof to an opening through at least one of said sides thereof, said insert end opening communicating with said pump, and a compressively elastically deformable sleeve interposed between said housing member and said insert, said sleeve being compressed radially against said insert sides including the portion of said one side having said insert side opening therethrough by generally radially inward forces exerted by said housing member upon said sleeve, the portion of said sleeve adjacent said housing member being retained against radially outward deflection by said housing member, the portion of said sleeve adjacent said insert encasing the portion of said insert having said insert side opening therethrough to normally seal said insert side opening and thereby prevent the liquid from leaking out of the nozzle, whereby when the pump is actuated, the liquid compressively elastically deforms the portion of said sleeve adjacent said insert so that the sleeve is forced away from said insert side opening and the liquid flows into said insert passage through said insert end opening, through said insert passage, out of said insert passage through said insert side opening, past said sleeve and out of said housing member passage.

4,036,407

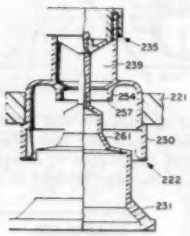
DOSING VALVE

Thomas James Slone, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 26, 1976, Ser. No. 670,587

Int. Cl.[2] E03D *9/03*

U.S. Cl. 222—188 **14 Claims**



1. An improved dosing valve having a stationary member and a moveable component for dispensing a metered dose of a liquid product from a substantially rigid reservoir containing a quantity of a liquid product, said moveable component being axially moveable manually upwardly and moveable downwardly by gravity between an UP position and a DOWN position respectively, said improvement comprising means for forming an air-lock seal between cooperating portions of said stationary member and said moveable component for independently obviating flow from said reservoir when said moveable member is disposed at said DOWN position, and means forming an other seal intermediate other cooperating portions of said stationary member and said movable component for independently obviating flow from said dosage valve when said moveable component is disposed at said UP position, and means including a dose chamber cooperatively associated with said air-lock seal and said other seal for metering and dispensing a said metered dose of said liquid product each time said moveable component gravitates downwardly from said UP position to said DOWN position, and for metering a dose-volume of air upwardly into said reservoir each time said moveable component is moved upwardly from said DOWN position to said UP position.

4,036,408

HOPPER HAVING MEANS FOR DIRECTING BLASTS OF GAS TO A DISCHARGE OUTLET OR THE HOPPER

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,363

Int. Cl.[2] B65G *3/12*

U.S. Cl. 222—193 **5 Claims**

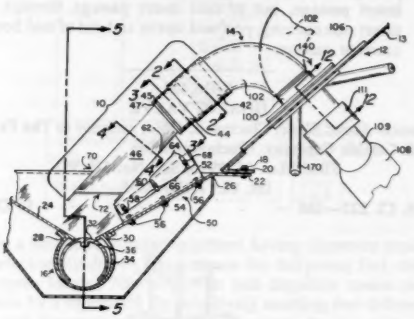
1. A hopper having a plurality of inclined sides; a bottom discharge outlet attached to the lower ends of the inclined sides;

a nozzle for directing blasts of gas into said hopper extending through one of said sides and into the interior of said hopper at a position spaced above said discharge outlet;

the portion of said nozzle extending within said hopper being of elbow shape;

a conduit fixedly mounted within said hopper, said conduit communicating at one end with said nozzle and extending downwardly to said discharge outlet to direct blasts of gas from said nozzle toward said discharge outlet;

means mounting said nozzle for rotation within said hopper between a first position aligned with and communicating with said one end of said conduit to direct blasts of gas toward said discharge outlet to dislodge bridged or



clogged lading adjacent said outlet, and a plurality of other positions directing said elbow shaped portion to other areas of the hopper to direct blasts of gas to said other areas to dislodge bridged or clogged lading at said other areas.

4,036,409

FLUID METERING DEVICE

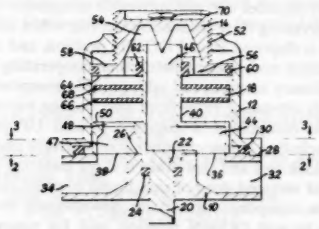
Jules Langlais, 8 Rue Claude Debussy, 59130 Lambersart, France

Filed Apr. 20, 1976, Ser. No. 678,472

Claims priority, application France, Apr. 23, 1975, 75.12582; Feb. 12, 1976, 76.03825

Int. Cl.² G01F *11/04*

U.S. Cl. 222—249 **7 Claims**



1. a fluid metering device comprising a sealed casing provided with an inlet pipe and a delivery pipe for the metered fluid, a piston defining two variable-volume chambers in the casing and a distribution unit which rotates or oscillates in the casing and co-operates in sealing-tight manner with the part of the walls adjacent the pipes, the unit being formed with a first passage opening directly into the first chamber and a second passage prolonged by a tubular portion which extends through the piston via an orifice along which it can slide, and which opens into the second chamber, the two passages being such that, during a portion of the rotation or oscillation, the inlet pipe is connected to the first of the two chambers and the delivery pipe is connected to the second chamber and, during another portion of the rotation or oscillation, the delivery pipe is connected to the first chamber and the inlet pipe to the second chamber, the resulting alternate connection causing the element forming a piston to move and deliver the fluid admitted into each of the two chambers, characterised in that the casing is a hollow upright cylinder, the base of which provides a plane upper surface perpendicular to the generating axis of the cylinder, the inlet and delivery pipes opening on to the said surface, the said surface co-operating in sealing-tight manner with movable plane surfaces of the distribution unit which bound the orifices of the two passages which extend from below and through the distribution unit.

4,036,410

INJECTION MOLDING MACHINE WITH FEED PLUNGER IN HOPPER

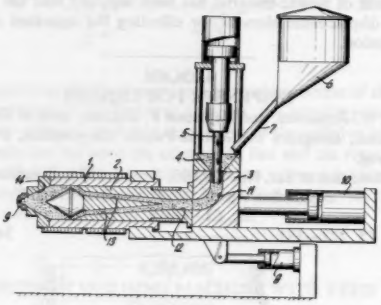
Ingolf Mombüecher, Reinfeld, Germany, assignor to Braas & Co. GmbH, Frankfurt am Main, Germany

Filed Jan. 24, 1975, Ser. No. 543,958

Claims priority, application Germany, June 29, 1974, 2431421

Int. Cl.² B29F *1/06*

U.S. Cl. 222—255 **6 Claims**



1. An injection molding machine for plastic material comprising an axially elongated injection cylinder, an axially extending displaceable element mounted in said injection cylinder with the axis of said displaceable element extending in the same direction as the axis of said injection cylinder, said displaceable emement having an axially extending bore therethrough, one of said injection cylinder and displaceable element being axially movable relative to the other, said injection cylinder and displaceable element each having a first end and a second end with the first ends of each facing in the same direction and the second ends facing in the opposite direction from the first ends, an injection nozzle positioned on the first end of said injection cylinder, a feed device located adjacent the second ends of said injection cylinder and displaceable element, said feed device including a feed hopper and a plunger reciprocally mounted in said feed hopper, a pressure block positioned between said feed hopper and the second end of said displaceable element, said pressure block having a passage therethrough in communication with and extending between said feed hopper and the bore at the second end of said displaceable element, said passage having a uniform cross sectional area for the axial length thereof, the passage in said pressure block having at least a substantially continuously curving section extending from the bore at the second end of said displaceable element toward said feed hopper, said bore in said displaceable element comprising a first section extending from the second end toward the first end of said displaceable element with said first section having a uniform transverse cross sectional area for the axial length thereof, and a second section extending from the end of said first section remote from the first end of said displaceable element toward the first end of said displaceable element and said second section comprising a plurality of ducts disposed in diverging relation from said first section of said bore toward the first end of said displaceable element, said displaceable element at the first end thereof

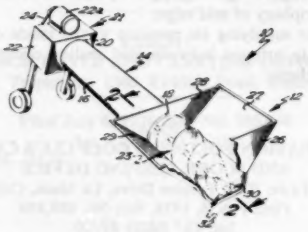
having a double cone-shaped tip, said plurality of ducts terminating at the opposite ends thereof from the first section of said bore adjacent said double cone-shaped tip, and the combined transverse cross sectional area of said plurality of ducts corresponding substantially to the transverse cross sectional area of said first section of said bore and also to the transverse cross sectional area of said passage through said pressure block.

4,036,411

LOW PROFILE AUGER AND HOPPER ASSEMBLY

Loren N. Westhoff, Salem, S. Dak., assignor to SOS Consolidated, Inc., Birmingham, Mich.

Filed Sept. 26, 1975, Ser. No. 617,110
Int. Cl.[2] B65G *33/14*
U.S. Cl. 222—413 **1 Claim**



1. Product conveying and distribution apparatus adapted to be disposed upon a supporting surface, said apparatus comprising:

a hopper for receiving said product, said hopper comprising:

2 a rigid, planar base surface of substantially triangular shape substantially parallel to said supporting surface, and adapted to contact same;

a plurality of sidewalls extending integrally upwardly from said planar surface and rigid therewith defining an upwardly opening product receptive enclosure; and

a rear wall projecting upwardly from a bottom edge of said hopper which intersects and coincides with the base line of said substantially triangular shaped base surface; and

an auger assembly comrising:

an elongated, tubular auger housing of substantially uniform diameter throughout the greater portion of its length having a rotatable auger supported and disposed therewithin, said auger assembly being received within said hopper obliquely with respect to said planar hopper surface, at a first predetermined angle with respect to said supporting surface; and said auger comprising a tapered flighting portion disposed adjacent said planar hopper surface, said tapered flighting portion of said auger tapered t a second predetermined angle, said first and second predetermined angles being substantially equal, whereby dead spots withibn said hopper are substantially avoided and mechanical contact between said planar surface and said auger tapered portion is obviated.

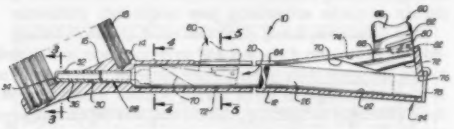
4,036,412

ELASTOMERIC CARTRIDGE WITH SLITTED NOZZLE TIP

Burnie M. Craig, Pasadena, Calif., assignor to Loren S. Fond, Beverly Hills, Calif.

Division of Ser. No. 449,822, March 11, 1974, Pat. No. 3,938,897, which is a continuation-in-part of Ser. No. 232,714, March 8, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,603
Int. Cl.[2] B65D *35/38, 35/52*
U.S. Cl. 222—490 **2 Claims**

1. A dispensing cartridge having a tubular tip of elastomeric material provided with a peripheral wall of nonuniform thickness in cross section and terminating in an end wall, said tip being provided adjacent its terminus with a self-closing slit extending longitudinally of said tip and having a portion formed in said peripheral wall and extending longitudinally of said tip away from said end wall, said peripheral wall, when viewed in cross section, comprising non- concentric inner and



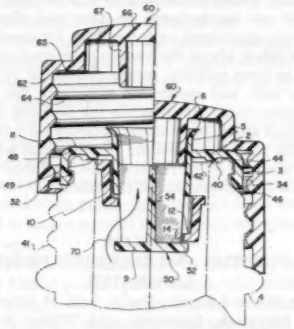
outer substantially circular walls, and said portion of said slit being formed in the thinnest portion of said peripheral wall.

4,036,413

CONTAINER CLOSURE CONSTRUCTION

Jean Bernard Camps, Sao Paulo, Brazil, assignor to Perticamps S.A.Embalagens, Brazil

Filed Apr. 23, 1976, Ser. No. 679,686
Claims priority, application Brazil, Oct. 27, 1975, 13500842
Int. Cl.[2] B65D *41/62*
U.S. Cl. 222—500 **4 Claims**



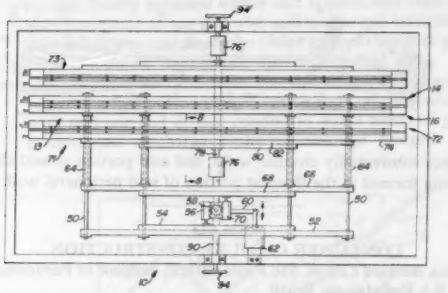
1. A closure contruction comprising a container having an externally threaded neck portion, with a top opening and a rim encircling the opening having an encircling cap bead receiving recess on the enterior thereof below said rim, an inner closure cap having a top cap part overying the container rim and a portion of the opening of the container and including an annular side skirt portion engaged around the exterior of said container neck portion, and with an inwardly extending cap bead engaged in a cap bead receiving recess of said container, said inner closure cap having a hollow cylindrical part extending through said top cap part and opening into the container and extending on the interior of said inner closure cap below the interior of said top cap part and extending on the exterior of said inner closure cap above the exterior of said top cap part, an outer cover having an internally threaded outer cover skirt part threadably engageable wih said internally threaded neck portion of said container, said outer cover having a top cap edge wall overlying said rim and engageable over said top cap part, said outer cover part also including a central raised cap part above said ledge wall overlying said hollow cylindrical part, and a stopper projection on the interior of said raised cap part engageable into said hollow cylindrical part, a floating stopper engaged in said hollow cylindrical part, having a bottom disc portion of a dimension greater than the diameter of the lower portion of said hollow cylindrical part, and a retaining ring having a flange engaged over said hollow disc portion, and being displaceable on said floating stopper, between said disc portion and the lower portion of said hollow cylindrical part.

4,036,414

FABRIC CREASING MACHINE

Fernando Miranda, Aguadilla 57 Condado, San Juan, P.R.

Filed Dec. 1, 1976, Ser. No. 746,365
Int. Cl.[2] D06J *1/00*
U.S. Cl. 223—28 **10 Claims**



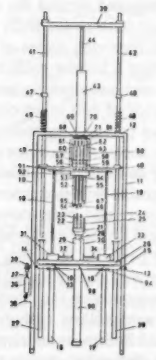
1. A fabric creasing machine comprising a first set of creasing bars with at least one of said bars being supported for relative movement in a horizontal direction between open and closed positions so as to produce a gap therebetween in the open position, means connected to at least said one bar for moving said one bar between an open and closed position, vacuum means associated with said bars for causing a limited portion of a fabric above the bars to enter such gap when the bars are in an open position, means connected to said bars for heating the bars, and means for subjecting the apex of the crease to superheated steam while the creasing bars are in a closed position applying heat and pressure only to the limited portion of the fabric between the creasing bars without applying heat or pressure to the remainder of the fabric immediately adjacent said limited portion of the fabric.

4,036,415

GLOVE TURNING AND BLOCKING PROCESS AND APPARATUS

Colin Filko; Richard Stanley Smith, both of Winnipeg; Lawrie Gandier McIntosh, Etobicoke, and Willem John Bouman, Toronto, all of Canada, assignors to Sterling Glove Machinery Ltd., Winnipeg, Canada

Continuation-in-part of Ser. No. 636,590, Dec. 1, 1975. This application Dec. 6, 1976, Ser. No. 747,670
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—40 **14 Claims**



6. Apparatus for turning and blocking gloves comprising:

at least one finger mounting member of relatively small diameter adapted to be received inside a finger of a stitched, inside out glove mounted thereon;

at least one finger receiving mandrel of relatively larger diameter adapted to be arranged in substantial longitudinal alignment with said at least one finger mounting member;

an expandable and retractable wrist clamp adapted to expand to grip the inside of the wrist portion of the glove mounted on said at least one finger mounting member, said wrist clamp being movable relative to said at least one finger mounting member in a direction longitudinally thereof towards and away from said at least one finger receiving mandrel, for transferring a glove finger mounted on said at least one finger mounting member onto said at least one finger receiving mandrel by rolling the finger onto the outer surface thereof;

a sealing clamp surrounding said at least one finger receiving mandrel and adapted to engage with the edge of the wrist clamp to grip therebetween in substantially sealing manner an edge of a glove gripped by said wrist clamp, around the periphery of said edge;

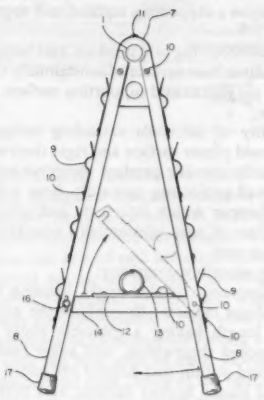
means for supplying air pressure to the inside of a glove sealingly gripped between said sealing clamp and said wrist clamp.

4,036,416

COMBINATION FOLDABLE GOLF CLUB CARRIER AND SCORE KEEPING DEVICE

Gerald W. Lowe, 9330 Tropico Drive, La Mesa, Calif. 92041

Filed Feb. 6, 1976, Ser. No. 655,856
Int. Cl.[2] B65D *69/00*
U.S. Cl. 224—45 R **2 Claims**



1. A foldable "A" frame device designed to relieve the golfer of inconveniences caused by unnecessarily heavy and bulky conventional golfing equipment; a device which is easy to carry around the golf courses and convenient to handle when stowing and transporting to and from the golf course; a structure consisting primarily of two identical "A" frame assemblies, each assembly a vertex block (**7**) with a hole to receive and secure by means of fasteners (**11**) an extended dowel (**1**) end of a handle, each said vertex block having tapered sides, the tapered sides of said vertex blocks slip fitting into aluminum channel legs (**8**) and each vertex block held accurately by one fastener (**10**) on which said legs can be pivoted from a 13° open angle, to an inward 0° closed position in which case said Legs would lie parallel to each other, and each leg consisting of four (more or less may be used according to manufacturers discretion) accurately formed thin spring steel gripper clips attached by fasteners (**10**) equally spaced vertically and aligned so that the horizontally positioned golf clubs can be easily inserted, securly held within the clip radii, and easily identified and snapped vertically on and off said clips, and in addition a golf ball tube and tray assembly main-

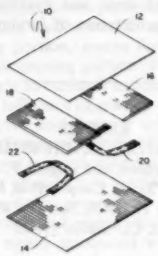
tains the proper spacing between the two "A" frames and it consists of a length of split plastic tube (13) which is used as a new type of receptacle for retaining golf balls and said tube is centrally attached to a tray (12) on which angles (14) serve as horizontal cross members to brace and rigidify the "A" frame assemblies, one end of each said Angle being attached to channel legs (8) by means of fasteners (10) which serves as a pivot to fold said tray assembly upward, an operation which precedes the folding of said channel legs (8) inward to the closed parallel position, opposite ends of said angles being notched for the purpose of locking said tray assembly into the open position by means of locating screws (25) and wing nuts (16) respectively, and finally it should be noted that if golf clubs are intact when said golf ball tube and tray assembly is folded upward, one club will interfere with said golf ball tube and must be removed from this position in order to achieve complete closure of said legs.

4,036,417

BOOK COVER AND CARRYING DEVICE

Seeran M. Traphagan, 1360 Kirkley Road, Columbus, Ohio 43221

Filed July 6, 1976, Ser. No. 703,066
Int. Cl.[2] B65D *77/00*
U.S. Cl. 224—45 N **9 Claims**



1. A cover for a book comprising:

a composite body panel including two substantially identically dimensioned sheets of flexible limp material with peripherally disposed raw edges, each said sheet having one surface carrying an ornamental aspect and being superimposed upon the other such that each said one surface is outwardly facing, the peripheries of each said sheet being mutually inwardly folded along a margin spaced a select distance from each corresponding said raw edge to define a body panel periphery having a contour generally corresponding to the contour of the outer cover of said book when open:

first and second pocket panels, each present as a sheet of flexible limp material with peripherally disposed raw edges, each said sheet being symmetrically shaped about a centrally disposed fold line, having one surface carrying an ornamental aspect and folded about said fold line to outwardly expose said one surface, each said folded first and second pocket panels being situated upon said composite body panel at mutually oppositely disposed portions of said body panel periphery, said pocket panel raw edges being superimposed in alignment with said body panel sheet raw edges, the peripheries of each said pocket panel sheet, when said pocket panel sheet is folded about said fold line, being unidirectionally folded along a margin spaced a select distance from each corresponding said raw edge thereof to define a three-sided pocket panel periphery aligned with adjacent said portions of said body panel periphery and defining therewith a pocket for receiving portions of said book outer cover;

first stitching internally disposed within said composite body panel, situate along and extendig through said body panel sheet and pocket panel margins, securing together said body panel sheets and said first and second pocket panels, continuous adjacent said aligned and superimposed pocket panel and body panel raw edges, and continuous along said body panel margin at least a select distance beyond said first and second pocket panel margins;

second stitching extending through said composite body panel and said first and second pocket panels, disposed outwardly thereupon and continuous along a margin spaced inwardly from said body panel periphery; and

first and second loop-type handles, each present as an elongate flexible limp material sheet having an ornamental aspect upon one surface thereof, folded along elongate fold lines to externally dispose said one surface, stitched to internally position the raw edges disposed in said elongate sense and to define oppositely disposed ends having exposed raw edges, said ends being internally disposed in spaced relationship within said composite body panel and secured thereto by said first and second stitching.

5. The method of making a cover for a book formed of two substantially identically dimensioned body panel sheets and two pocket panels each said body panel and pocket panel sheet being present as a single, limp, flexible sheet having one surface representing an ornamental aspect, the method comprising the steps of:

superimposing said two body panel sheets one upon the other with the peripherally disposed raw edges thereof being coincident and said one surface of each being arranged in mutually facing relationship;

folding symmetrically each said pocket panel sheet in half, the peripherally disposed raw edges of each half being coincident and said one surface of each being outwardly disposed when so folded;

positioning a said folded pocket panel sheet intermediate said two body panel sheets are oppositely disposed locations, said coincident raw edges of each said folded pocket panel sheet being coincident with adjacent said raw edges of each said body panel sheet and said folds therein being disposed in facing parallel relationship and spaced a given distance apart;

stitching through the assemblage of said body panel sheets and said folded pocket panel sheets, said stitching being located along a first margin spaced inwardly a select distance from corresponding said body panel sheet raw edges, said stitching being carried out in continuous fashion and commencing and terminating within a said space intermediate said pocket panel folds to define a gap;

turning said assemblage inside-out through said gap; and

stitching through said turned assemblage along a second margin spaced from said first margin and continuously about the entire peripheries of said body panel sheets.

4,036,418

SPOOL HOLDER

Kazimirz Chiebda, 425 Margaret Ave., Baltimore, Md. 21221

Filed Jan. 28, 1976, Ser. No. 653,244
Int. Cl.[2] A47G *23/00*
U.S. Cl. 224—48 F **2 Claims**

1. A spool holder comprising in combination:

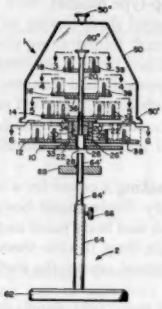
a. a base adapted to support a plurality of circular horizontal spool supporting discs in spaced relationship, one above the other and above the said base, including a bottom disc rotatably supported on said base and means for supporting at least two independently rotatable discs at different spaced intervals from the bottom disc and from each other and on the same vertical axis as the said bottom disc including a plurality of spool-positioning pins positioned on the supper surface of each disc,

b. a spacer positioned adjacent the center of the upper surface of the bottom disc having a central opening extending therethrough including a shoulder adjacent the bottom of the spacer and adjacent the upper surface of the bottom disc,

c. a coupling for connecting the base with the said spacer

having an outwardly turned flange about the upper portion thereof for engaging the shoulder of the spacer for rotatably supporting the spacer and the bottom disc on the said base and means for fixing the said coupling to at least the base member,

d. a plug element fixed within the upper portion of the said spacer having a central opening therein,



e. the means for supporting the independently rotatable discs being in the form of a perpendicular spindle, said spindle being affixed to said plug element,

f. separately spaced spacers affixed to the spindle for supporting each of the two upper discs centrally and at spaced intervals on said spindle, each upper disc having a central opening extending therethrough to permit independent rotation of each upper disc around the spindle.

4,036,419

SEVERING APPARATUS

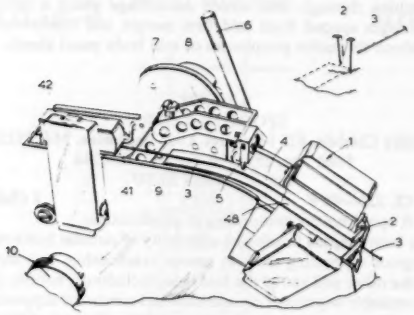
Paul Christopher Hensel, Woodbridge, and Ronald Geoffrey Spiers, N. Wembley, both of England, assignors to The Post Office, London, England

Filed July 7, 1976, Ser. No. 703,187

Claims priority, application United Kingdom, July 14, 1975, 29511/75

Int. Cl.[2] B26F *3/00*

U.S. Cl. 225—96.5 **11 Claims**



1. A device for severing a dielectric optical waveguide comprising at least one dielectric optical waveguide clamping means for holding a portion of said dielectric optical waveguide against an anvil means, means for applying a constant force to said anvil means independent of displacement of said anvil means so that a pre-set tension is applied to said dielectric optical waveguide, and knife means for engaging said dielectric optical waveguide and initiating a fracture through said dielectric optical waveguide.

4,036,420

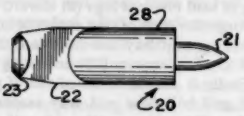
PINWHEEL FOR PAPER FEEDING

Frank J. Lockwood, 7011 W. Archer Ave., Chicago, Ill. 60638

Continuation-in-part of Ser. No. 640,259, Dec. 13, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,735

Int. Cl.[2] B65H *17/38*

U.S. Cl. 226—87 **10 Claims**



6. A pinwheel feeding mechanism for feeding paper and the like having a platen, a plurality of movable feeding pins seated in sockets in said platen for continuously and progressively advancing paper and the like for an associated mechanism, wherein, said pinwheel comprises a feeding mechanism having a preformed platen of aluminum, having sockets machined in said platen to selected dimensions, said platen being anodized thereby providing a durable, yet easily machined platen, and said pins having an inside end and an outside end, said inside end being tapered from a point spaced from said outside end for providing increased wear and durability characteristics while preventing the penetration of foreign matter past said pin.

4,036,421

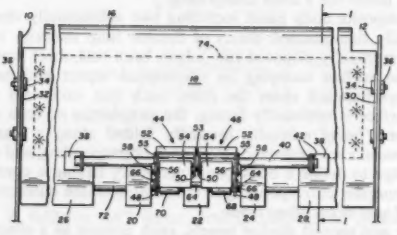
WEIGHTED PINCH ROLLS

Robert P. Clark, Richardson, and Eugene F. Miller, Plano, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed June 17, 1976, Ser. No. 696,956

Int. Cl.[2] B65H *17/22*

U.S. Cl. 226—185 **2 Claims**

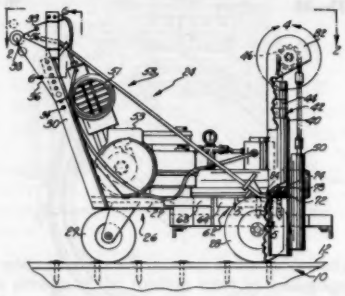


1. A transport assembly comprising: support means, a drive roll rotatably mounted on said support means about a given first axis, a pair of axially spaced apart bracket means pivotally mounted independently of each other intermediate the ends thereof on said support means about a second axis generally parallel to said first axis, each said bracket means including a pair of axially spaced apart inner and outer legs rigidly secured to each other, the inner leg of each bracket means facing each other, weight means for each of said bracket means located between respective pair of said inner and outer legs and pivotally secured thereto, a shaft extending between said outer legs of each of said bracket means generally parallel to said axes said operatively connected to only the outer leg of each of said bracket means, a pair of axially spaced pinch rollers located on said shaft between a respective pair of said inner and outer legs and rotatably carried by said bracket means, said weight means providing a force biasing said rollers into engagement with said drive roll.

4,036,422
ROOFING NAIL APPLICATOR

William R. Harvey, Hinckley, Ohio, assignor to Lexsuco, Inc., Solon, Ohio

Filed Apr. 30, 1975, Ser. No. 573,008
Int. Cl.[2] B27F 7/02
U.S. Cl. 227—110 7 Claims



1. Apparatus for driving a fastener into a portion of a piece of material, said apparatus comprising a weight adapted to be supported in a raised position a predetermined vertical distance above the portion of said material, said weight including a fastener impacting portion, means for aligning said fastener with said fastener impacting portion of said weight, means for releasing said weight to enable it to accelerate from said raised position under the influence of gravity for imparting a force to said fastener to drive said fastener into said portion of said material and including an air actuatable piston, a chain having a first portion thereof secured to said weight, a second portion of said chain being secured to a portion of said air actuatable piston, a pulley adapted to engage said chain between said first and second portions, said means for releasing said weight further including means associated with said air actuatable piston for rapidly moving said piston in a first direction for rapidly urging said chain in a first direction tending to create sufficient slack between the first and second portions of the chain to permit said weight to fall said predetermined distance under the influence of gravity, means associated with said air actuatable piston for moving said piston in a second direction for moving said chain in a second direction for raising said weight to said raised position after weight has driven said fastener into said material and for maintaining said weight in the raised position until released by said means for releasing said weight, said air actuatable piston cooperating with said chain to prevent said weight from dropping more than a predetermined distance greater than said predetermined vertical distance.

4,036,423
EXPANDABLE PACKAGE

Robert L. Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 517,145, Oct. 23, 1974, abandoned.
This application May 24, 1976, Ser. No. 689,494
Int. Cl.[2] B65B 43/02, 85/70
U.S. Cl. 229—43 9 Claims

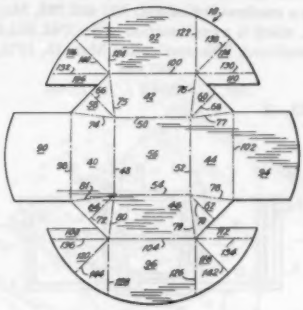
1. A non-metallic food package comprising a base portion and a flexible cover and capable of providing in an expanded condition a volume substantially greater than the volume of the package in a storage condition,

said base portion comprising a bottom panel of polygonal shape, side panels foldably connected to said bottom panel to form an open container section, and a flange portion foldably connected to said side panels,

said flange portion comprising a plurality of vertical support panels and connecting panels therebetween, each connecting panel being foldably connected to one adjacent vertical support panel and being adhesively bound to another adjacent vertical support panel, so that said flange portion has a continuous outer periphery,

said flexible cover being secured to said flange portion along said outer periphery,

said flange portion being folded inwardly of the side panels into said open container section, and

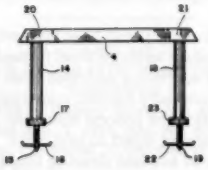


said connecting panels being outwardly expandable, whereby said flange portion and said flexible cover provide said package in the expanded condition with a volume substantially greater than the volume of the package in the storage condition.

4,036,424
HANDLE DEVICE

Imre Thany, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 19, 1976, Ser. No. 650,161
Int. Cl.[2] B65D 5/46
U.S. Cl. 229—52 A 9 Claims



1. A handle device, comprising

handle means, said handle means including a leg; and

grapple means affixed to the handle means for grappling an inside surface of a puncturable container, said grapple means comprising resilient wire affixed to the leg of the handle means and having ends, said wire flattening to the leg when the leg is forced to penetrate into a container and stretching out due to its resiliency after penetrating the container and catching the inside surface of the container with its ends when the handle is pulled.

4,036,425

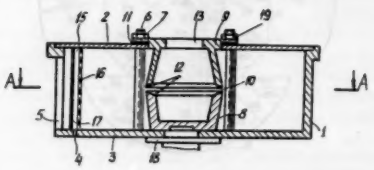
ROTOR FOR A CENTRIFUGE

Mikhail Ivanovich Ilin, ulitsa Sadovaya, 214, kv. 5, Krasnodar; Viktor Ivanovich Polyakov, Sudskoi proezd, 17, korpus 1, kv. 83, Moscow; Valery Alexandrovich Trofimov, ulitsa Kirova, 67, kv. 25, Penza; Ivan Karpovich Drankovsky, ulitsa Slavy, 5, kv. 41, Penza, and Alexandr Ivanovich Boitsov, prospekt Pobedy, 91, kv. 60, Penza, all of U.S.S.R.

Continuation of Ser. No. 575,424, May 7, 1975, abandoned, which is a continuation of Ser. No. 467,785, May 7, 1974, abandoned, which is a continuation of Ser. No. 332,137, Feb. 13, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 667,946

Int. Cl.[2] B04B *1/10, 15/06*

U.S. Cl. 233—2 4 Claims



1. A centrifuge rotor comprising: a housing with a removable sealing lid arranged concentrically; a tapered accelerating bowl disposed inside said housing and attached to the bottom thereof concentrically; filtering vanes arranged inside said housing between the bottom thereof and said lid, each filtering vane being pivotally attached at its end which is spaced at a minimum distance from the axis of the housing, said rotor housing accommodating an additional tapered accelerating bowl secured concentrically to said housing on said lid so that the two bowls face each other with their end faces of the largest diameters and define a gap therebetween through which the starting product is fed to the filtering surface of the vanes, said diameters being equal.

4,036,426

METHOD OF CLEANING A CENTRIFUGE

Thomas Hamilton Little, Devon, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 15, 1974, Ser. No. 442,697

Int. Cl.[2] B04B *3/04*

U.S. Cl. 233—7 12 Claims

1. A method of cleaning a centrifuge after use for processing materials, said centrifuge having a bowl formed about a generally horizontal axis and being provided with an axial screw conveyor disposed coaxially therein, comprising the steps of:

a. emptying said bowl of process materials;

b. introducing cleaning liquid to said bowl;

c. rotating said bowl and said cleaning liquid therewith for a substantial period of time to impose upon said cleaning liquid by rotation a centrifugal force which is approximately equal to or less than the gravitational force on said cleaning liquid, whereby the axial screw conveyor and the interior of the bowl are cleaned by the agitating and tumbling action of the cleaning liquid; and

d. emptying said bowl;

the step of introducing cleaning liquid to said bowl being performed by partially filling said bowl until it contains no more of said cleaning liquid than the volumetric capacity of the bowl for cleaning liquid during normal process operation with the bowl rotating.

4,036,427

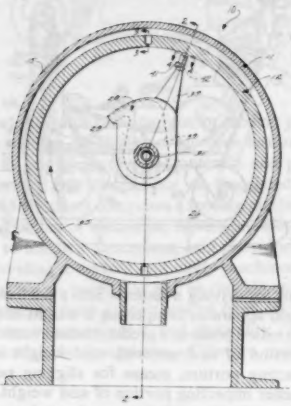
COMBINATION PITOT PUMP AND CENTRIFUGAL SEPARATOR

John W Erickson, Huntington Beach; Vitolis Budrys, La Mirada, and Francis Barton Brown, La Crescenta, all of Calif., assignors to Kobe, Inc., Huntington Beach, Calif.

Filed June 6, 1975, Ser. No. 584,574

Int. Cl.[2] B04B *1/12, 11/08*

U.S. Cl. 233—10 70 Claims



1. A combination pitot pump and centrifugal separator, including:

a. a rotary casing mounted for rotation in a selected direction about an axis;

b. means for delivering to the interior of the casing a contaminated fluid to be pumped and cleaned;

c. a pumped fluid discharge duct coaxial with the casing;

d. a pitot tube extending radially of said axis in the rotary casing and having adjacent its outer end an inlet facing in a direction opposite to the direction of rotation of the rotary casing, the pitot tube having a passage connected to the inlet and extending generally in the direction of casing rotation and toward the axis to an outlet connected to the discharge duct;

e. orifice means carried by the outer periphery of the rotary casing and communicating between the interior and the exterior thereof for discharging from the casing contaminant matter in fluid introduced into the casing and separated centrifugally therefrom within the casing; and

f. means operable during pumping and separating operation of the pump and separator for agitating centrifugally separated accumulations of contaminant matter on the inner surface of the casing along the entire extent of the outer periphery thereof.

4,036,428

FLUID PRESSURE OPERATED EDDY CURRENT BRAKE FOR AIR DRIVEN CENTRIFUGE

Douglas Howard Durland, and Malcolm Canmore McGilvray, Jr., both of Palo Alto, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 29, 1976, Ser. No. 681,303

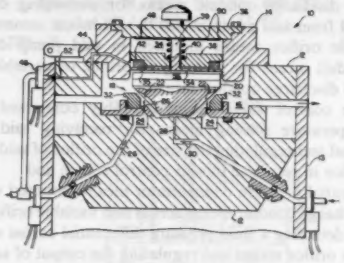
Int. Cl.[2] B04B *9/06*

U.S. Cl. 233—23 R 5 Claims

1. In an air driven centrifuge having a rotor at least a portion of which is formed of an electrically conductive material and means for rotating the rotor on a supporting cushion of pressurized air about an axis, an improved method of braking the rotor when rotating comprising the steps of:

a. moving a source of constant magnetic flux from a first

position wherein it is biased against the bias force to a second position by a fluid pressure means to allow the rotor to freely rotate, said first position being so disposed that eddy currents are induced into said electrically conductive portion of the rotating rotor sufficient to produce a braking effect to rapidly reduce the rotation of the rotor, said second position being so disposed that substantially



no eddy currents are induced in the electrically conductive portion of the rotating rotor by said magnetic flux; and,

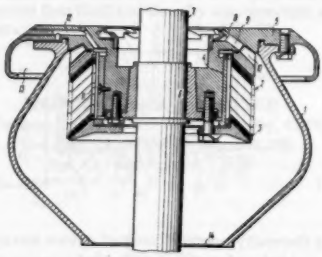
b. removing said fluid pressure means whereby said source of constant magnetic flux will be moved by the bias force from said second position to said first position to brake the rotor.

4,036,429

BOWL OF CENTRIFUGAL SEPARATOR

Jury Filoretovich Ivin, ulitsa Kosareva, 15, kv. 62; Arkady Nikolaevich Levischev, ulitsa Griboedova, 30, kv. 21, both of Sverdlovsk, and Vasily Ivanovich Sokolov, Kutuzovsky prospekt, 2, kv. 181, Moscow, all of U.S.S.R.

Filed Mar. 18, 1975, Ser. No. 559,409
Int. Cl.[2] B04B *1/08*
U.S. Cl. 233—27 **8 Claims**



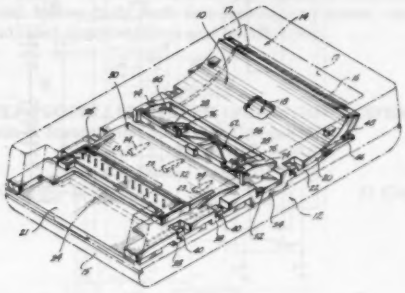
1. In a centrifugal separator, a pack of cone-shaped discs and means carrying said pack with the discs thereof arranged along a common axis passing through the centers of said discs, spacer means being situated between each pair of adjacent discs for providing therebetween a gap of predetermined thickness, each disc having an inner suface directed toward and an outer surface directed away from said axis, and each disc fixedly carrying on one of its surfaces a plurality of elongated strips circumferentially distributed about said axis and extending substantially radially with respect thereto so that the strips fixed to said one surface of each disc define radial spaces between themselves, and said strips having a thickness less than the thickness of said gap so that while liquid is compelled to flow radially in said spaces between said strips the liquid is free to flow circumferentially in the part of each gap situated beyond the strips situated therein, the major portion of the liquid which is to be separated passing radially through the spaces between said strips while the part of each gap situated beyond said strips defines a stagnant zone of annular configuration in which there is a substantially negligible movement of the liquid being separated so that solid particles can accumulate in the stagnant zone, and liquid-delivery means situated adjacent one end of said pack for delivering liquid to be separated thereto.

4,036,430

MANUALLY OPERABLE CARD READER

Helmut Eppich, West Vancouver, Canada, assignor to Ebco Industries, Ltd., Richmond, Canada

Filed May 13, 1976, Ser. No. 686,244
Int. Cl.[2] G11B *25/10*
U.S. Cl. 235—61.11 E **25 Claims**



1. A manual card reader for reading data recorded on a card comprising:

card guide means having defined therein first and second card openings and a slotted passageway having first and second oppositely disposed major boundary walls and first and second oppositely disposed minor boundary walls, said passageway being dimensioned for the passage of a card and interconnecting said first and second card openings, said passageway including a first region extending a predetermined distance from said first card opening and a second region inclined relative to said first region and extending between said first region and said second card opening, the inclination between said first and second regions of said passageway for causing a card inserted in said first card opening and manually pulled from said second card opening to frictionally contact at least a portion of said major boundary walls of said passageway; and

data reading means for supplying an electrical signal representative of said data recorded on said card, said data reading means positioned along said slotted passageway in spaced proximity with said second card opening, said data reading means supplying said electrical signal as a card is manually moved through said passageway.

4,036,431

METHOD AND APPARATUS FOR USE IN SETTING A COUNTER

Lars F. Gidlof, 999 N. Doheny Drive, Los Angeles, Calif. 90069

Filed Apr. 2, 1976, Ser. No. 673,199
Int. Cl.[2] H03K *21/36*; G06M *3/14*
U.S. Cl. 235—92 PE **6 Claims**

1. An apparatus for use in setting the output of a counting means capable of providing an output indicating a numeric value corresponding to the number of electric pulses supplied to a first terminal of said counting means, which indicated number is capable of being either increased or decreased as said pulses are supplied to said counting means in accordance with a signal supplied to a second input terminal of said counting means, said apparatus comprising:

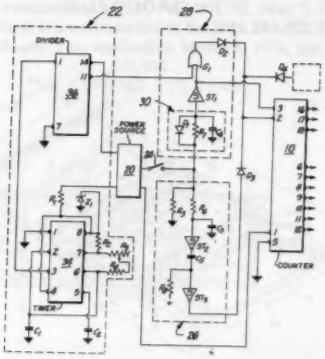
power supply means for supplying electric power,

a first pulse generating means for providing a series of electric pulses capable of being counted by said counting

means, said first pulse generating means being connected to said power supply means,

a second pulse generating means for providing within a first time interval a pulse capable of being counted by said counting means each time a current is supplied to said second pulse generating means,

control means for concurrently within a second time interval which is greater than said first time interval providing a



signal to said second input terminal of said counting means and providing pulses from said first pulse generating means to said first terminal of said counting means each time current is supplied to said control means, and

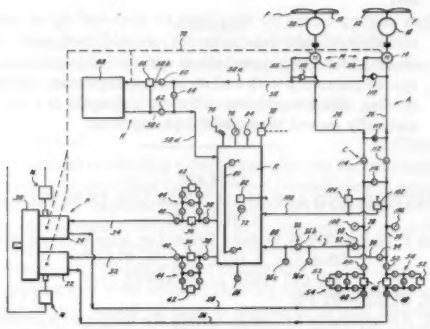
normally open switch means for concurrently connecting said control means and said second pulse generating means to said power supply so that when said switch means is closed current is simultaneously supplied to said control means and said second pulse generating means.

4,036,432

VARIABLE SPEED FAN DRIVE SYSTEM

Albert L. George, P.O. Box 3604, Lafayette, La. 70501

Filed Nov. 3, 1975, Ser. No. 628,125
Int. Cl.[2] F01P 7/02
U.S. Cl. 236—35 **1 Claim**



1. A variable speed fan drive system comprising:

fan means for cooling a substance;

pump means for supplying operating fluid to operate said fan means;

motor means in fluid communication with said pump means to receive operating fluid therefrom for rotating said fan means at a speed corresponding to the fluid displacement of said pump means;

temperature sensing means for sensing the temperature of the substance cooled by said fan means and producing a pressure control signal corresponding to the temperature;

pump displacement control means operably connected between said temperature sensing means and said pump means for regulating the fluid displacement of said pump means in response to said control signal wherein said pump displacement means includes:

pump discharge conduit means for conveying operating fluid from said pump means to said motor means;

variable orifice means mounted in said pump discharge conduit means for forming an orifice of variable size in said discharge conduit means;

orifice control valve means operably connected to said temperature sensing means for receiving said control signal and regulating the size of the orifice of said variable orifice in response to said control signal; and

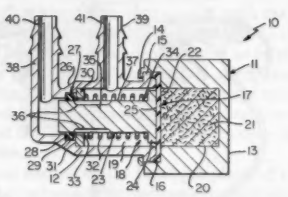
differential pressure compensator means mounted with said discharge conduit means across said variable orifice means for detecting a fluid pressure differential across said variable orifice means and regulating the output of said pump means in response thereto, whereby the output of said pump means is regulated in response to the temperature of the substance cooled by said fan means.

4,036,433

THERMALLY OPERATED CONTROL DEVICE AND METHOD OF MAKING THE SAME

Joseph P. Wagner, and Byron L. Jackson, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 6, 1975, Ser. No. 629,291
Int. Cl.[2] G05D 23/02
U.S. Cl. 236—100 **12 Claims**

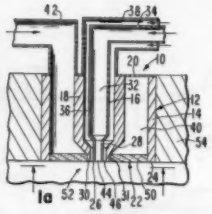


1. In a thermally operated control device having a housing means provided with a chamber divided into two sections by a flexible diaphragm and with thermally expansible material filling one of said sections to act on one side of said diaphragm and with a plunger disposed in the other of said sections and having one end thereof abutting the other side of said diaphragm to be moved thereby, the improvement wherein said sections are substantially of the same size adjacent said sides of said diaphragm and wherein said one end of said plunger substantially fills said other section adjacent said other side of said diaphragm to minimize the deformation and stretching of said diaphragm as said materia. forces said diaphragm into said other section upon expansion of said material, said housing means including two parts secured together with said diaphragm having an outer peripheral means secured between said parts and a normally flat center part coplanar with said peripheral means, each housing part having a substantially cylindrical interior surface respectively defining one of said sections of said chamber, said one end of said plunger being substantially rigid and substantially disc-shaped, said plunger having a reduced substantially cylindrical body extending medially from said disc-shaped end thereof.

4,036,434
FLUID DELIVERY NOZZLE WITH FLUID PURGED FACE

Roger E. Anderson, Rancho Cordova, and Emil Schmauderer, Jr., Folsom, both of Calif., assignors to Aerojet General Corporation, El Monte, Calif.

Filed July 15, 1974, Ser. No. 488,472
Int. Cl.[2] B05B 7/00, 15/02
U.S. Cl. 239—8 23 Claims

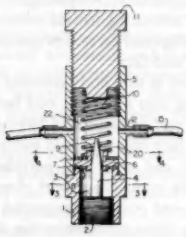


1. A method of handling a first fluid having dissolved or suspended solids therein comprising: directing said first fluid along a confined path having an exit end; injecting the first fluid from said path into a region adjacent to the exit end of the path; and forming a fluid buffer near said exit end of said path to prevent any substantial rearward flow of the first fluid after it exits from said path to thereby prevent the build up of said solids at said exit end of the path by directing a second, pressurized fluid to a point proximate said exit end, dividing the second fluid into a multiplicity of second fluid streams and discharging the streams in an exit end surrounding relation to thereby generate in said region a relatively low pressure, low velocity and low volume buffer defined by the second fluid, said buffer flowing in the same direction as the first fluid flowing in said region; whereby the buffer flow prevents the backflow of injected first fluid and thereby also prevents said build up of solids.

4,036,435
DRIP IRRIGATION EMITTER

George J. Pecaro, P.O. Box 633, Pauma Valley, Calif. 92061

Filed July 23, 1975, Ser. No. 598,250
Int. Cl.[2] B05B 1/32, 15/02
U.S. Cl. 239—116 12 Claims

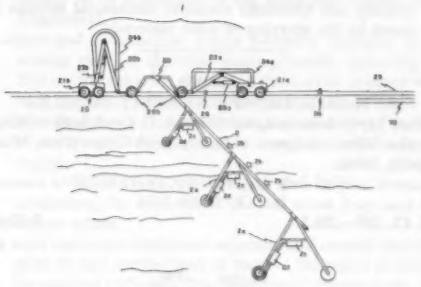


1. A drip irrigation emitter for controlling the flow of fluid in an irrigation system comprising:
a. a hollow elongated body having a hollow interior and at least one outlet port;
b. an inlet connector fitting into an end of said hollow body;
c. a pin member fixedly attached to said inlet connector and extending axially within said hollow body;
d. a collar member axially movable within said hollow body, said collar member having a center bore with said pin member projecting into said bore to form a varying volume orifice defined as the space between the boundary of the bore and the periphery of the pin member wherein the flow of said fluid through said emitter is controlled by the size of said orifice;
e. a seat member extending radially from the interior of the hollow elongated body;
f. means for transmitting a yieldable force to said collar member in a direction opposite to the direction of flow of said fluid through said emitter, urging it toward said seat member; and
g. adjuster means coupled to said yieldable force transmitting means for adjusting the yieldable force exerted thereby, wherein said adjuster means are positioned on said hollow body such that said adjuster means can be adjusted exteriorly from said hollow body.

4,036,436
SELF-PROPELLED LINEAR IRRIGATION SYSTEM

Norman S. Standal, Star Rte., Bliss, Idaho 83314

Filed Sept. 2, 1975, Ser. No. 609,343
Int. Cl.[2] B05B 3/18; A01G 25/09
U.S. Cl. 239—183 21 Claims

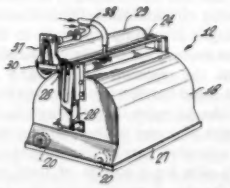


1. A self-propelled linear irrigation system comprising:
a. an elongated line move having a plurality of sprinkler outlets along its length;
b. a plurality of mobile supports spaced along said line move;
c. a main tractor having a water pipe outlet engaging means and a compressed air pipe outlet engaging means;
d. a pneumatic prime mover attached to each mobile support and to the main tractor for propelling same; and
e. linear guide means for said tractor.

4,036,437
APPARATUS WITH REVERSING LINEAR TRAVERSE MECHANISM FOR SPRAYING MATERIAL

Alfred J. Dreher, Pasadena, Calif., assignor to Alfred J. Dreher, Padadena, Calif.

Filed Feb. 18, 1976, Ser. No. 658,890
Int. Cl.[2] B05B 3/18
U.S. Cl. 239—186 23 Claims



1. A machine for directing a spray of material across a target surface, said machine having a carriage movable in a first direction across the target surface and nozzle means supported

in the carriage, for spraying the material against the target surface, wherein the improvement comprises:

a shaft rotatably mounted in said carriage, having oppositely directed spiral camming threads thereon, and aligned in a second direction substantially perpendicular to said first direction in generally parallel relation to said target surface;

drive means for rotating said shaft;

a sliding nut for engaging one at a time of said spiral camming threads, with means for automatically engaging alternate ones of said camming threads at opposite extremes of travel of said nut on said shaft, to convert rotational motion of said shaft to linear reciprocating motion of said nut at a substantially constant speed;

a housing for said shaft and said nut, including means engaging said nut to maintain alignment thereof and prevent rotation thereof on said shaft; and

carrier means connecting said nut to said nozzle means, including sealing means to exclude harmful material from said housing;

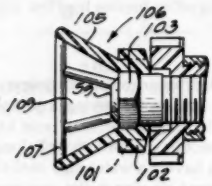
whereby said nozzle means is reciprocated linearly in said second direction without drive reversal or unnecessary dwell at the ends of its travel, and said shaft, nut and housing can withstand transient mechanical stresses imposed by the spraying of some materials.

4,036,438

ANTI-INJECTION PAINT SPRAY NOZZLES

Richard Leroy Soderlind, and Glenn A. L. Lund, both of Minnetonka, Minn., assignors to Sperry Tech Corporation, Minneapolis, Minn.

Filed July 21, 1975, Ser. No. 597,757
Int. Cl.[2] B05B *1/04*
U.S. Cl. 239—288.5 **9 Claims**



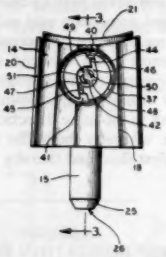
1. A safety nozzle assembly for airless spray cup guns comprising, in combination, a nozzle member having an axial end with a conical depression extending into the axial end and reducing in diameter to a point adjacent a co-axial nozzle orifice open to the depression, the conical depression having a depth between approximately 3 and 9 mm and an included angle of between 30° and 90°, a protective barrier extending outwardly from the nozzle member in the direction of a stream of spray exiting the depression, the barrier including an extended annular member attached to the periphery of the nozzle member, the annular member having a wall portion extending downstream from the nozzle member axial end a distance greater than 15 mm and terminating at an annular open end, the wall portion being circumferentially discontinuous for at least a portion its length providing openings to the interior of the extended barrier radially outwardly and axially adjacent to the nozzle member, the opening providing a free flow of air through the extended barrier, the openings having a dimension preventing accidental entry therethrough to the interior of the barrier of a finger of a user of the cup gun except through the open end, the extended barrier dimensioned to prevent injection of a user's skin by a stream of fluid exiting the nozzle opening when the skin is positioned at the open end, the conical depression preventing injection of the user's skin when the skin substantially covers the depression at the time of activation of the cup gun, the depression providing a hydrostatic cushion by having an internal area between the nozzle opening and the axial face which will be substantially filled by pumped fluid exiting the orifice within a period less than the time period necessary for penetration of the skin of a user by the pumped fluid stream when the skin closes the end face, the conical depression and extended barrier each having a minimum diameter at any point downstream of the nozzle opening greater than the diameter of a cone of spray from the nozzle orifice at that point.

4,036,439

SPRAY HEAD FOR NEBULIZATION OF FLUIDS

Elward Howard Green, Addison, Ill., assignor to Newman-Green, Inc., Addison, Ill.

Filed Sept. 24, 1975, Ser. No. 616,406
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—466 **12 Claims**



1. A spray head having means including a duct for dispensing nebulized fluid from a pressurized container comprising;

a body member having a projection terminating at an outer face and having at least two passages communicating with said duct and extending to said outer face;

baffle elements disposed on said projection extending axially outwardly of said face;

an insert mounted in said body member having a peripheral wall extending into a bore in said body member radially outwardly of said passages and having a radial wall comprising a rear face opposing said baffle elements and forming therewith and with said peripheral wall inner and outer generally concentric swirl chambers, said passages having outlet end portions tangential to said outer chamber providing inlets communicating therewith;

said baffle elements each having an arcuate contour and having a leading end portion including means directed into the direction of swirling moment of the fluid stream for splitting the stream to cause a part thereof to continue in the outer chamber and divert a part thereof to churn in the inner chamber;

each baffle element having a trailing portion in respect to the direction of movement of the fluid in said chambers comprising a surface diverging toward the splitting means of the adjacent baffle element and;

said insert having a discharge orifice in the radial wall thereof communicating with said inner chamber.

4,036,440

METHOD AND APPARATUS FOR THE TREATMENT OF WASTE WOOD, SUCH AS STUMPS AND SNAG, TO MAKE IT SUITABLE FOR THE PRODUCTION OF PAPER PULP

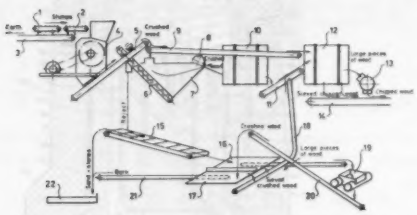
Eino Mäkilä, Pulp; Unto Virtanen, Joutseno, and Kyösti Savinainen, Pulp, all of Finland, assignors to Joutseno-Pulp Osakeyhtio, Pulp, Finland

Filed Dec. 30, 1975, Ser. No. 645,337

Claims priority, application Finland, Jan. 17, 1975, 750112

Int. Cl.[2] B02C *23/10*

U.S. Cl. 241—20 **9 Claims**



1. A method for the continuous treatment of raw waste wood including stumps and snag to remove sand, stone, earth, other impurities and bark attached thereto and embedded therein and to thereby render said waste wood suitable for the production of pulp, the method comprising

delivering said raw waste wood to a crushing zone;

crushing said raw waste wood to fragment it and to partially loosen the attached and embedded impurities and bark therefrom;

passing the crushed wood fragments, detached impurities and detached bark to a washing zone including a washing tank containing water;

subjecting the material fed into the washing zone to jets of water under high pressure as the material enters the washing tank to further promote the removel of bark and impurities from the crushed wood fragments;

passing said materials fed into the washing zone into the water in said water tank where an accept portion, comprising crushed wood fragments and bark, tends to float to a discharge outlet at the top surface of the water and a reject portion, comprising sand, stone, earth, bark and heavier crushed wood fragments, tends to sink to a discharge outlet at the bottom of said water tank;

subjecting the sinking material in the washing tank to submerged flow jets;

controlling the strength and direction of said submerged flow jets to entrain the heavier crushed wood fragments with the accept crushed wood fragments while permitting the sand and stone impurities and the heaviest crushed wood fragments to sink to the bottom of the washing tank;

discharging said accept portion, including the heavier crushed wood fragments entrained therewith, from the top surface of the water tank and delivering said accept portion to a chipper for further treatment;

passing said reject portion to a separation zone where the sand and stones therein are separated from the heaviest crushed wood fragments and bark therein;

feeding said separated crushed heaviest wood fragments of the reject portion to a coarse sieve which retains the larger heaviest crushed wood fragments of the reject portion; and

passing the retained larger heaviest crushed wood fragments of the reject portion to the chipper where they are reduced to a size suitable for pulp porduction.

4. An apparatus for continuous treatment of waste wood including stumps and snag to remove sand, stone, earth and other impurities and bark attached thereto and embedded therein to thereby render said waste wood suitable for production of pulp, the apparatus comprising

crusher means for fragmenting said raw waste wood and partially loosening the attached and embedded impurities and bark therefrom;

a washer tank for washing the sand, earth and stone impurities and bark from said crushed wood fragments and for separating said materials into accept and reject portions, said washer tank having a body of water therein sand having an inlet region for receiving the output from said crusher means, a first outlet region near the surface of said body of water for discharging an accept portion of said crusher output, comprising crushed wood fragements and bark which tend to float near the surface of said body of water, and a second outlet region at the bottom of the water tank for discharging a reject portion of said crusher output, comprising sand, stone, earth, bark and heavier crushed wood fragments which tend to sink towards said second outlet region;

means adjacent said first outlet region for removing said accept portion from said tank;

nozzle means near the inlet region of said washer tank for directing jets of water under high pressure against the crushed wood fragments as they are received by said tank to promote the detachment of impurities and bark attached to or embedded in the incoming crushed wood fragements;

submerged flow nozzle means pivotally mounted in said washer tank for directing water generally upwardly said first outlet region for entraining the heavier crushed wood with the accept portion of the crusher output while permitting the sand and stone impurities and the heaviest crushed wood fragments to sink towards the second outlet region;

means attached to said submerged flow nozzle means for controlling the direction of flow of water from said flow nozzle means;

a sand separator positioned adjacent said second outlet region of said washer tank to receive the reject portion of the washed materials, comprising sand, stones, earth, bark and the heaviest crushed wood fragments, and to remove said sand, earth and stones from said bark and heaviest crushed wood fragments;

a coarse sieve positioned to receive said bark and heaviest crushed wood fragments of the reject portion from said sand separator for retaining the larger heaviest crushed wood fragments; and

means for receiving said larger heaviest crushed wood fragments from said coarse sieve and for chipping the retained larger heaviest crushed wood fragments to reduce them to a size suitable for pulp production.

4,036,441

PROCESS FOR RECOVERING USABLE MATERIALS FROM WASTE MATERIAL CONTAINING METALS AND NON-METALS

Albert T. Basten, Voerendaal, and Hubert H. Dreissen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Mar. 29, 1976, Ser. No. 671,542

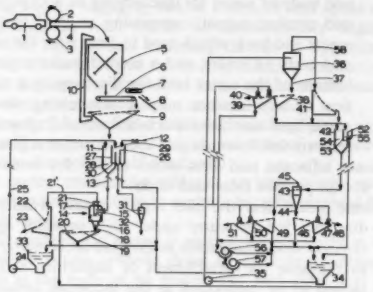
Claims priority, application Netherlands, Mar. 29, 1975, 7503809

Int. Cl.[2] B02C *23/10*

U.S. Cl. 241—20 **14 Claims**

1. A process for separating scrap comprised of non-ferromagnetic metals into several fractions by specific gravity, which scrap has been recovered from waste products composed of metals and non-metals in a preliminary treatment, said preliminary treatment comprising the steps of grinding said waste and reducing the particle size to a size ranging up to about 50 mm, magnetically separating ferromagnetic components from the ground waste and separating by a primary specific-gravity separation non-metallic components from the non-ferromagnetic metallic portion of the ground waste, the said process comprising the steps of mixing said non-ferromag-

netic metallic portion with a heavy, preferably aqueous suspension medium having a specific gravity of at least 2.2, feeding said mixture to a secondary specific-gravity separator comprising a hydrocyclone having a top angle of the cone-shaped part ranging between 45° to 90°, separating the non-ferromagnetic portion into first and second portions, discharging the first portion comprised of the suspension and a specifically heavy



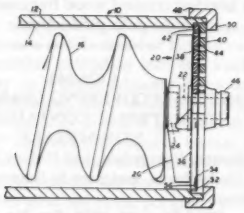
fraction from the tip of the secondary hydrocyclone, said heavy fraction comprised of metals having a specific gravity of more than 3.0, discharging the second portion comprised of the suspension and a specifically lighter fraction from the overflow of the hydrocyclone, said lighter fraction comprised of metals having a specific gravity of less than 3.0, and draining the suspension away from the heavy and lighter fractions.

4,036,442

LOW FRICTION MEAT EXTRUDER AND CUTTER MEANS THEREFOR

J. Haywood Barnes, Wadsworth, Ohio, assignor to Edwin W. Oldham and Vern L. Oldham, Akron, Ohio, part interest to each

Filed Nov. 26, 1975, Ser. No. 635,403
Int. Cl.[2] B02C *18/36*
U.S. Cl. 241—82.5 **9 Claims**



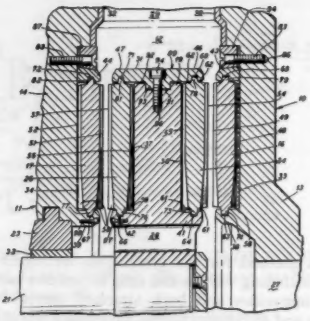
1. In a meat cutting and/or extrusion device including a frame having a tubular portion in which a screw extruding means is positioned for forcing meat along the axis of such frame portion, the combination of an operative apertured discharge means carried by said frame at an end thereof and positioned normal to said axis, a rotatable cutter means secured to and rotating with said extruding means immediately adjacent said discharge means for cutting the meat into pieces, said discharge means comprising an apertured metal reenforcing disc and an apertured low friction plastic cutter disc positioned adjacent said cutter means and being parallel to said metal disc, the apertures in said metal and plastic discs being aligned, and means securing said discharge means to said frame.

4,036,443

REFINER HEAD ASSEMBLY AND REFINING DISK THEREFOR

Martin O. Saltarelli, Lenox, Mass., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 511,936, Oct. 3, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,612
Int. Cl.[2] B02C *7/12*
U.S. Cl. 241—297 **8 Claims**



1. A refiner head assembly for use in a refiner apparatus, said assembly comprising

a. a backing head means having an axis, said head means having a circumferentially extending, radially spaced inner flange means upstanding from one face thereof and further having a circumferentially extending, axially spaced outer flange means upstanding from said one face thereof, said flange means being in radially spaced relationship,

b. each of said inner and outer flange means further having a circumferentially extending sidewardly opening groove defined therein, said respective grooves being in generally opposed relationship to each other,

c. refining disk means adapted to be positioned adjacent said one face between said inner and said outer flange means having an axially located aperture defined therein, said refining disk means having an inner radially inwardly projecting, circumferentially extending tongue means defined in radially inner edge portions of said refining disk means, and further having an outer radially outwardly projecting, circumferentially extending tongue means defined in radially outer edge portions of said refining disk means,

d. said inner and outer tongue being adapted to seat in said inner and outer groove means, respectively, when said backing head means and said refining disk means are in assembled engagement with one another,

e. said refining disk means defining spaced, opposed side face portions thereon, said face portions adapted for working a pulp composition when said refiner head assembly is operatively connected with a disk refiner apparatus,

f. the interrelationship between said backing head means, said refining disk means, said flange means, said groove means, and said tongue means being such that said refining disk is operatively joinable to said backing head with either one of said opposed side faces thereof being in adjacent relationship to said one face and yet maintain a desired configuration between exposed side face and said backing head means.

4,036,444

APPARATUS FOR PNEUMATICALLY SEPARATING A FOOT LAP FROM A SPINNING COP

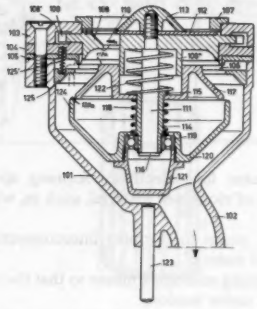
Xaver Suter, Thalwil, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed June 21, 1976, Ser. No. 697,943

Claims priority, application Switzerland, July 3, 1975, 8685/75

Int. Cl.² B65H *67/08, 54/22*

U.S. Cl. 242—35.6 E **10 Claims**



1. Apparatus for pneumatically separating a foot lap from spinning cops (**14'**) for use in automatic winding machines, comprising

a housing (**101, 103, 104**) having a longitudinal axis and formed with a suction connection (**102**) to which pneumatic suction is applied;

a suction nozzle terminating the suction connection in the housing including

a rotating centering cone (**113**) and a cone support element (**108**) having an upper surface (**112**) facing the spinning cop (**14'**) and being formed with a nozzle opening (**110**) communicating with the suction connection (**102**);

means forming a first clamping position (**250**) for thread (**200**) sucked from the spinning cop (**14'**) located beneath the upper surface (**112**) including

means forming a first clamping surface (**108*a***) located beneath the upper surface (**112**) and rotatable therewith;

a rotatable first clamping element (**117**) having a second clamping surface (**117*a***) cooperating with the first clamping surface (**108*a***);

means (**123, 119, 118**) effecting relative axial movement of said first clamping position forming means and said first clamping element (**117**) to engage said first and second clamping surfaces (**108*a*, 117*a***) upon such axial movement and pinch a sucked-off thread (**200**) therebetween;

means forming a second clamping position (**251**) for thread (**200**) sucked from the spinning copy (**14'**) located axially beneath said first clamping position (**250**) and having means (**125**) forming a third clamping surface;

a second clamping element (**120**) having a fourth clamping surface (**120*a***) cooperating with the third clamping surface;

operating means (**123, 121**) effecting relative axial movement of said third clamping surface forming means (**125**) and said second clamping element (**120**) to engage said third and fourth clamping surface and pinch a sucked-off thread (**200**) therebetween;

said operating means (**123, 121**) being operable sequentially with respect to said means forming the second clamping position to stretch a sucked-off thread essentially taut between said first and second clamping positions (**250, 251**);

and cutter means (**106**) located in interfering position with respect to an imaginary straight surface between said clamping positions to sever a thread (**200**) clamped between said clamping positions (**250, 251**).

4,036,445

CIRCUIT ARRANGEMENT FOR MONITORING THE OPERATION OF AN ELECTRONIC YARN CLEARER

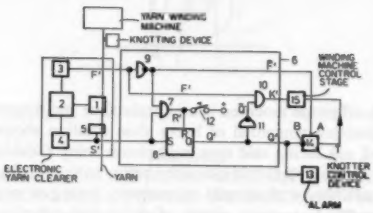
Hansruedi Stutz, Dietlikon, and Hans Späni, Zurich, both of Switzerland, assignors to Aktiengesellschaft Gebruder Loepfe, Wetzikon, Switzerland

Filed Apr. 21, 1975, Ser. No. 569,786

Claims priority, application Switzerland, May 15, 1974, 6637/74

Int. Cl.² B65H *63/02;* D01H *13/22;* D02J *1/14;* G01L *5/04*

U.S. Cl. 242—37 A **6 Claims**



1. An electronic yarn clearer mounted on an automatic yarn winding machine provided with an automatic yarn knotting device, said electronic yarn clearer comprising yarn transverse dimension sensing means, an electronic circuit serially connected to said sensing means and having a first output stage means for generating cutting pulses indicative of incorrect yarn transverse dimension, and a second output stage means for generating continuous signals indicative of yarn travel, or signals indicative of failure of yarn travel or yarn, said failure signal serving for inhibiting the winding operation and actuating the yarn knotting device, and further comprising a circuit arrangement for detecting incorrect operation of the electronic yarn clearer, said circuit arrangement having a first input operatively connected to said first output stage means and a second input operatively connected to said second output stage means, and comprising logic means for combining said cutting pulses and continuous signals into at least one logic output signal indicative of continued yarn travel during a predetermined time interval commencing with said cutting pulse.

4,036,446

METHOD AND APPARATUS FOR BRAKING A BOBBIN CHUCK AND FOR RELEASING A BOBBIN TUBE THEREON

Hugo Schär, Dattlikon, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sept. 26, 1975, Ser. No. 617,235

Claims priority, application Switzerland, Oct. 9, 1974, 13554/74

Int. Cl.² B65H *63/08*

U.S. Cl. 242—39 **12 Claims**

1. In combination

a machine frame;

a stop mounted on said frame;

a friction drive drum;

a rotatable bobbin chuck pivotally mounted on said machine frame for movement towards and away from said drum, said chuck including a releaseable bobbin tube holding device;

a brake shoe including a bore therein;

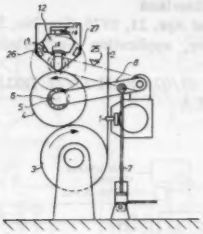
means for moving said chuck towards said brake shoe;

means pivotally mounting said brake shoe about a fixed axis on said machine frame;

means in said bore for guiding said brake shoe radially of said axis and to define a pressure chamber;

pneumatic means for supplying pressurized gas to said chamber of said brake shoe;

a connection between said pressure chamber and said bobbin tube holding device for supplying pressurized gas to said holding device to release a bobbin tube thereon; and



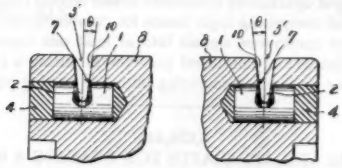
a push-off piston mounted in said brake shoe and disposed in a direction tangential of brake shoe rotation about said fixed axis facing said stop, said piston being slidably disposed in a cylinder in communication with said chamber to selectively close said connection during a winding operation to prevent release of said bobbin tube holding device and open said connection upon stoppage of said bobbin chuck to release said holding device.

4,036,447

GROOVED TRAVERSE DRUM FOR WINDER

Masao Mino, Yao, Japan, assignor to Kabushiki Kaisha Mino Seisakusho, Osaka, Japan

Filed Oct. 30, 1975, Ser. No. 627,355
Claims priority, application Japan, Nov. 7, 1974, 49-135105
Int. Cl.² B65H *54/28, 54/48*
U.S. Cl. 242—43.2 **3 Claims**



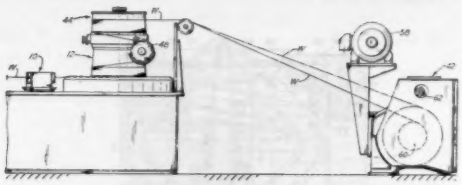
1. In a grooved traverse drum construction having a cylindrical drum body and a spiral yarn guide groove formed in the peripheral surface of the cylindrical drum body, said yarn guide groove having a traverse end at each end of the drum body, with each traverse end having opposed spaced lateral side walls therein, the improvement of an aperture extending into each end of the drum body and intersecting the bottom of the opposed lateral side walls of each traverse end of the yarn guide groove, a wear-resistant element positioned in each axially extending aperture and extending inwardly beyond the traverse end of the yarn guiding groove, each of said wear-resistant elements comprising a body portion and a recess having opposite spaced side walls centrally positioned in said body portion, with the opposite spaced side walls of the recess portion being flush with the opposed spaced lateral side walls of each traverse end of the yarn guide groove and constituting a lower extension thereof whereby said recess portion constitutes the bottom of each of the traverse ends of the yarn guide groove.

4,036,448

APPARATUS FOR FORMING SPOOLED AND SPOOL-LESS BUNDLES OF WIRE AND THE LIKE

Charles Henry Carey, and Donald Richard Haury, both of Cuyahoga Falls, Ohio, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 14, 1975, Ser. No. 621,708
Int. Cl.² B21C *47/00*
U.S. Cl. 242—81 **5 Claims**



1. An apparatus for selectively forming spool-less and spooled bundles of elongated material, such as, wire, comprising:

a draw block means for forming interconnecting convolutions of said material,

means for rotating said block means so that the convolutions are formed under tension,

material collecting means selectively employed for receiving material from said draw block means to form spool-less bundles of said material,

said block means including means for supporting said collecting means for rotation with said drawing block means,

material accumulating means selectively employed in place of said collecting means for receiving material from said draw block means to form spooled bundles of said material,

said accumulating means including supportable by said draw block means,

said accumulating means also including means for selectively allowing the accumulating means to rotate with said draw block means for allowing relative rotation therebetween, and

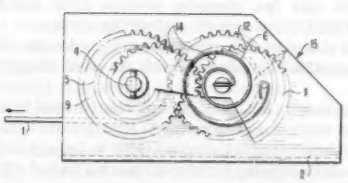
spooling means for receiving said material from said accumulating means for forming said material into a spooled bundle.

4,036,449

BELT ROLL-UP MECHANISM FOR A SAFETY BELT IN A VEHICLE

Winfried Schreiber, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 5, 1975, Ser. No. 610,787
Claims priority, application Germany, Sept. 6, 1974, 2442745
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107 **12 Claims**



1. A belt roll-up mechanism for a safety belt means in a vehicle, comprising a pull-back means effective at least during the driving operation for acting upon the safety belt means and shifting means for controlling the value of the pull-out force developed by the pull-back means, said shifting means including two axially parallel disposed cam wheels in slip-free engagement with each other, each cam wheel hving an effective

lever arm, said shifting means varying the effective lever arms of said cam wheels over the entire pulled-out range of the safety belt means for controlling the pull-out force.

4,036,450

METHOD AND APPARATUS FOR PAYING OUT WIRE

James O. Lowery, Ranburne, Ala.; Jimmy D. Blackmon, Carrollton, Ga.; W. Carl Jones, Carrollton, Ga., and Lee K. Brewton, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 23, 1975, Ser. No. 643,917
Int. Cl.[2] B65H 49/00
U.S. Cl. 242—129 4 Claims

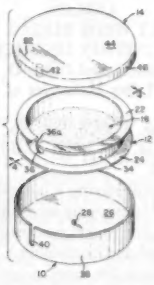
1. Apparatus for paying-out wire from a horizontally disposed coil of wire of given diameter comprising a stemless wire pack container for holding the coil of wire, means for withdrawing wire overhead from said stemless container, said withdrawing means including guide means disposed a substantial distance above said container at a point disposed on the vertical axis of said coil for substantially reducing the magnitude of the inward component of force acting along the wire as it is withdrawn from said container, said distance being such that the ratio of the distance to the diameter of the coil is at least 5:1, said withdrawing means including a rotatable sheave having a groove formed in the periphery thereof, first means for guiding the wire onto the sheave and second means for guiding the wire off the sheave, said first and second guiding means being arranged with respect to said sheave to assure that the wire contacts said sheave over approximately 270° of the periphery thereof.

4,036,451

HOOK AND LEADER STORAGE DEVICE

Denzil B. Pipkin, 20626 Cypress, Alderwood Manor, Wash. 98036

Filed July 30, 1976, Ser. No. 710,253
Int. Cl.[2] B65H 45/18; B65D 85/66
U.S. Cl. 242—137.1 11 Claims



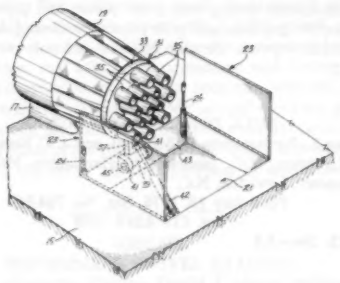
1. A hook and leader storage device comprising:
a container,
a reel journaled in the container and having a hook storage zone, said reel having a leader storage zone therearound within said container,
hook anchoring means in the hook storage zone,
inner port means in the reel for the passage of leaders from hooks anchored in the hook storage zone to the leader storage zone,
outer port means in the container arranged to be placed in registration with said first port means responsive to turning of the reel, whereby a leader tied to a hook placed in anchored position in the hook storage zone can be passed radially outward through said inner and outer port means with its free end outside of the container and then can be wound on the reel to occupy the leader storage zone by turning the reel in the container.

4,036,452

RETRACTABLE ENGINE NOISE SUPPRESSION SYSTEM FOR OVER-THE-WING JET AIRCRAFT

George S. Schairer, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 544,238, Jan. 27, 1975, abandoned. This application May 6, 1976, Ser. No. 683,771
Int. Cl.[2] B64D 33/06
U.S. Cl. 244—1 N 7 Claims



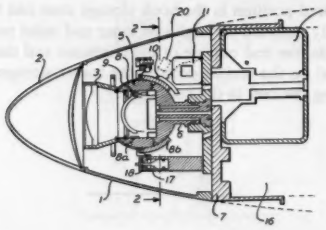
1. In a jet aircraft including wings and jet engines mounted such that the exhausts of said jet engines pass chordwise over said wings and create noise sources having centers located beyond the trailing edge of said wings, the improvement comprising a plurality of multiple aperture arrays, one of said multiple aperture arrays being associated with each of said jet engines of said aircraft, each of said multiple aperture arrays being movable between a stowed position whereat said multiple aperture array lies outside of the exhaust path of the jet engine with which said array is associated and an operative position whereat said multiple aperture array lies in the exhaust path of the jet engine with which said array is associated, each of said multiple aperture arrays including a plurality of apertures spaced from one another and positioned so as to split the exhaust of the jet engine with which said array is associated into separate streams when said array is in its operative position, said spacing being such that ambient air is entrained by said separate streams and mixes with the separate exhaust streams of said jet engines, said entraining and mixing of said ambient air with said exhaust streams causing the centers of said noise sources to be moved from said locations beyond the trailing edge of said wings to said locations above the wings of said aircraft.

4,036,453

WIDE ANGLE TORQUING SCHEME

John Lorenz Evans, Oakland, and Bart Joseph Zoltan, Old Tappan, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jan. 7, 1976, Ser. No. 647,224
Int. Cl.[2] F41G 7/00; G01C 19/28, 19/12, 19/24
U.S. Cl. 244—3.16 6 Claims



1. In an optical gyroscope device having a spherically shaped rotor mounted on gas bearings, a torquer system comprising:

a plurality of torquer pole pieces positioned around the lower rotor hemisphere of said gyroscope,

a bias coil, said bias coil establishing a flux field about said pole pieces when an excitation current is permitted to flow therethrough,

a control coil, said control coil, establishing a flux field about said pole pieces caused by a current commanding movement of the rotor of said gyroscope, and

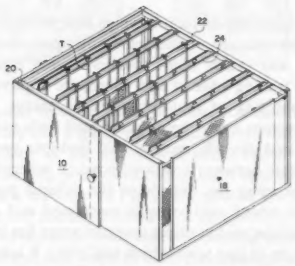
magnetically permeable means affixed to said lower rotor hemisphere facing said poles pieces and separated by a narrow gap from said pole pieces for closing the magnetic circuit between the pole faces of said pole pieces.

4,036,454

BULK TOBACCO CONTAINER

Bertram L. Jordan; John D. Mitchell, and J. C. Sessoms, Jr., all of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed July 13, 1976, Ser. No. 704,869
Int. Cl.[2] A24B 1/08
U.S. Cl. 294—5.5 2 Claims



1. A bulk container for tobacco leaves comprising in combination:

a. a six-sided container having at least one side completely open so as to receive a mass of tobacco leaves,

b. a tine frame which is adapted to fit over and engage the open side of said container,

c. a plurality of tines that are adapted to pass through openings in the tine frame and penetrate downwardly into the mass of tobacco within said container, each of said tines consisting of an elongated rod which is pointed at its lower end and bent over at an essentially right angle at its other end,

said tine frame comprising

1. a pair of elongated parallel side members that are spaced apart a distance corresponding to the distance between two opposite side members of said six-sided container,

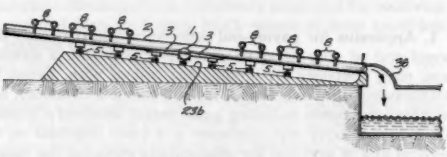
2. a plurality of parallel tine support members extending between said parallel side members and at right angles thereto, each tine support member being composed of two elongated sections of metal that are joined together at right angles, one of said sections having a plurality of holes therein which the pointed ends of said tines are adapted to be inserted and the other of said sections having slots therein which are adapted to accomodate the bent over portions of said tines.

4,036,455

AIR-CARGO LINER

Philip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 23, 1974, Ser. No. 535,413
Int. Cl.[2] B64D 9/00
U.S. Cl. 244—118 R 18 Claims



1. The method of handling cargo for an air-cargo liner having a landing gear which comprises tilting the air-cargo liner laterally while supported by its landing gear and thereby tilting the wing of the air-cargo liner into a spanwise inclined position with its lower tip spaced from the ground, and moving cargo through the lower tip of the spanwise inclined wing into a cargo hold in the wing.

7. An air-cargo liner comprising a wing including a covering and several elongated, substantially straight, spar and cargo hold tubes of constant and uniform cross section throughout their lengths having their lengths extending spanwise of said wing unbrokenly from wing tip to wing tip and forming structural wing spars integrated with said wing covering, said tubes having openings in corresponding outboard ends through a tip of said wing for loading cargo into the interior of said tubes.

4,036,456

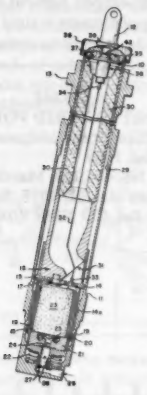
ROCKET CATAPULT WITH DIRECT MECHANICALLY ACTUATED IGNITION OF ROCKET MOTOR

Everett B. Skinner, Gilbert, and James O. Lair, Tempe, both of Ariz., assignors to Talley Industries of Arizona, Inc., Mesa, Ariz.

Filed Mar. 5, 1975, Ser. No. 555,444
Int. Cl.[2] B64D 25/10
U.S. Cl. 244—122 AD 9 Claims

1. In a rocket catapult having a catapult tube and a rocket motor tube capable of telescoping apart upon actuation to eject a mass from a vehicle, the rocket motor tube having an exhaust nozzle at its lower end and containing a solid fuel propellant charge, the improvement for causing ignition of such propellent charge comprising: a mechanically actuable igniter in the rocket motor tube disposed to ignite such propellant; and mechanical actuating means connected said igniter and an anchoring portion of the rocket catapult which is maintained

within the catapult tube throughout operation of the rocket catapult, for directly mechanically actuating said igniter when



the rocket motor tube has traveled a predetermined distance with respect to the catapult tube.

4,036,457

AIRCRAFT DE-ICING

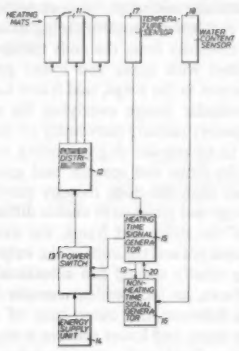
Wolfgang Volkner, Rellingen, and Hellmuth Schmedemann, Tornesch, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 8, 1975, Ser. No. 611,270

Claims priority, application Germany, Sept. 10, 1974, 2443224

Int. Cl.² B64D *15/14*

U.S. Cl. 244—134 D **4 Claims**



1. In a method for de-icing aircraft surfaces by means of a plurality of electrical resistance heaters which are sequentially supplied with heating current, the delivery of current to each heater being effectuated during a succession of cycles each constituted by a heating period during which heating current is supplied to the heater and a nonheating period during which no current is supplied to the heater, thereby controlling the average current supplied to the heater, the improvement comprising controlling the duration of each period of a cycle by the steps of: measuring the temperature at the resistance heaters; measuring the water vapor content of the atmosphere surrounding the aircraft; adjusting the length of the heating period of each heater during each cycle as a function of the measured temperature at the resistance heaters, and adjusting the length of the nonheating period for each heater during each cycle as a function of the measured water vapor content.

4,036,458

DEVICE FOR THE BIDIRECTIONAL MOVEMENT OF AN INFORMATION SUPPORT

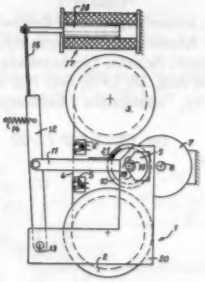
Henri Matthey, La Chaux de Fonds, and Georges Delessert, Vesenaz, both of Switzerland, assignors to Telectronics SA, Geneva, Switzerland

Filed Aug. 20, 1974, Ser. No. 498,968

Claims priority, application Switzerland, Sept. 18, 1973, 13384/73

Int. Cl.² G03B *1/04*; G11B *15/32*

U.S. Cl. 242—201 **10 Claims**



1. A device for the bidirectional feeding of an information support having first and second spools about which the support is wound, a reversible motor with a driving shaft, an idle roller, means mounting said idle roller for movement between three positions, said idle roller contacting said driving shaft and said first spool in one of said positions, said idle roller contacting said driving shaft and said second spool in a second of said positions, and said idle roller being out of contact with said driving shaft in the third of said positions, and means for moving said idle roller selectively to any of said three positions.

4,036,459

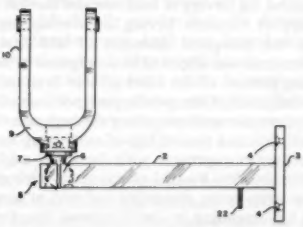
INSTRUMENT SWIVEL BRACKET

Merwin K. Alexander, Clayton; Daniel J. Meyer, Ballwin, and Philip Cohen, Clayton, all of Mo., assignors to Optical Associates, Inc., St. Louis, Mo.

Filed Feb. 27, 1976, Ser. No. 661,977

Int. Cl.² F16M *1/00*

U.S. Cl. 248—11 **6 Claims**



1. A swivel bracket for mounting a projector or other instrument away from a supporting surface, and including an extension having the length to dispose the bracket a distance away from a surface, said extension having one end capable of fastening to a supporting surface, fastening means provided for mounting the extension and its held bracket to a supporting

surface, said bracket including a swivel yoke for mounting of an instrument, said yoke incorporating a ball proximate its bottom end, said extension having means provided proximate one end to acccommodate the said ball for swivel movement, said means comprising a separable swivel socket, said swivel socket being separable into approximate halves, fastening means securing said halves together, an integral annulus provided proximate the upper portion of said socket for seating said ball from above, approximately one half of said annulus being formed on each of said half sockets, a projection extending from the lower portion of said socket, for locating said ball from below, and said projection extending from one of said half sockets.

4,036,460
DEVICE FOR DEPENDENTLY SUPPORTING AN OBJECT

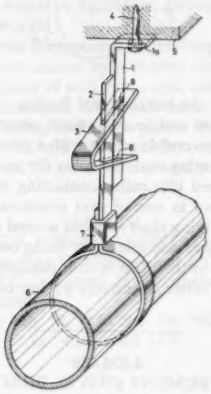
Friedrich Storck, Rodenberg; Rudolf Kunesch, and Gernot Missbach, both of Munich, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 28, 1975, Ser. No. 608,687

Claims priority, application Germany, Sept. 2, 1974, 7429525[U]

Int. Cl.² E21F *17/02*

U.S. Cl. 248—59 **8 Claims**



1. A support device for dependently supporting an object comprising a first elongated support element, a second elongated support element, and a clamp strap disposed in locking engagement with said first and second support elements, said clamp strap having a first leg and a second leg, each of said first leg and second leg having at least one slot therein, said first and second support elements having an overlapping portion extending in the elongated direction of said first and second support elements and disposed in contiguous relation with the overlapping portion of the other of said first and second support elements, each of the overlapping portions of said first and second support elements extending through one of said slots in each of said first and second legs of said clamp strap and being held in locking engagement with the other said support element within the slots by said clamp strap, each of said legs of said clamp strap being elongated and said at least one slot in each said leg extending in the elongated direction of the leg, wherein the improvement comprises that at least one of said first and second support elements is band-shaped and flat and has a rectangularly shaped transverse cross section, at least a portion of said slots in each said leg of said clamp strap in which said band-shaped support element is positioned has the same rectangularly shaped transverse cross section as said band-shaped support element for receiving said band-shaped support element in form-fitted engagement and the rectangularly shaped transverse cross section of said band-shaped support element having a longer dimension and a short dimension with the longer dimension extending in the elongated direction of the leg of said clamp strap and being greater than the shorter dimension of said band-shaped element extending transversely so that said band-shaped element is rigid in the direction of the longer dimension of the transverse cross section thereof.

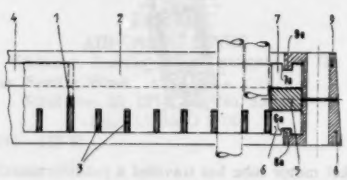
4,036,461
SUPPORTING GRID FOR PIPES

Vincenzo Soligno, Milan, Italy, assignor to Breda Termomeccanica S.P.A., Milan, Italy

Continuation of Ser. No. 456,223, March 19, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,475

Int. Cl.² F28F *9/00*

U.S. Cl. 248—68 R **2 Claims**



1. A supporting grid for pipes comprising:

a. an upper and lower set of intersecting strips having interengaging milled slots at the intersecting points, and

b. an external annular frame, said frame being formed of a lower and an upper part of substantially identical configuration, an upper and lower set of block-like spacers positioned between the ends of adjacent strips to substantially fill the peripheral space therebetween, said spacers having opposed, generally radially extending surfaces in surface-to-surface contact with substantial surface areas of the ends of adjacent strips, said strips and said frame being of different materials, said strips being provided at their ends with upper and lower grooves facing axially outwardly and spaced inwardly from the ends thereof, said spacers being provided with upper and lower grooves aligned with the grooves in the strips, said frame having an upper and lower annular flange overlying the surface of the strips and spacers radially outwardly of the grooves and terminating in an annular dog extending axially into said grooves in the strips and spacers, said grooves having a width greater than the dogs thereby providing play between the dogs and grooves to enable differential thermic expansion of the strips and frame, the axially inner surfaces of the spacers and the ends of the strips being aligned and defining axially spaced and substantially continuous annular surfaces, an independent annular ring extending peripherally between the outer ends of the strips and between the upper and lower spacers in engagement with said annular surfaces, and means securing the upper and lower parts of the frame together to enable assembly without deformation and to rigidly secure the grid in assembled condition.

4,036,462
MUSICAL INSTRUMENT SUPPORTING APPARATUS

Edward A. Sheftel, 1456 Colby, Apt. 4, Los Angeles, Calif. 90053

Filed June 22, 1972, Ser. No. 265,157

Int. Cl.² G10G *5/00*

U.S. Cl. 248—166 **1 Claim**

1. A musical instrument supporting apparatus comprising:

a. a pair of base members each having:

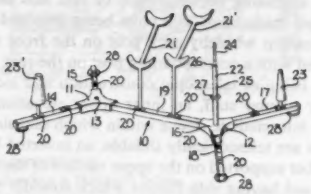
i. a central hub;

ii. a pair of legs pivotally coupled to said central hub and

adapted to be pivotally rotated about a pivoting end thereof and being in a planar relationship with respect to each other when pivoted to their extended position;

iii. an extender pivotally coupled to said central hub and adapted to be pivoted about a pivoting end thereof and being in a planar relationship with respect to said legs when pivoted to its extended position;

b. a spreader bar adapted to be removably coupled to said extenders, the ends of said spreader bar each being slidably mounted about one of said extenders when said extenders are in the extended position;



c. musical instrument supporting means for securelysupporting musical instruments, said musical instrument supporting means comprising an instrument support having first and second cylindrical members in axial abuttment with one another, said first cylindrical member having a smaller diameter than said second cylindrical member, and a base member in axial abuttment to said second cylindrical member and disposed on the opposite end thereof from said first cylindrical member; and

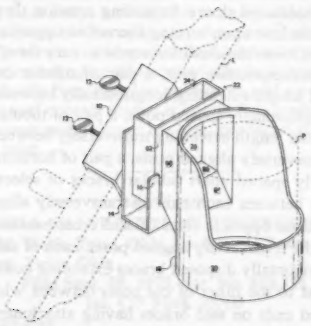
d. supporting means disposed within said central hub, legs and spreader bar, each of said supporting means having portions in cooperative relationship with said mounting members.

4,036,463

PAINT CAN AND BRUSH RECEPTACLE

Jeffrey E. Hopkins, Danville, Va., and Bobby B. Bennett, Reidsville, N.C., assignors to Jeffrey E. Hopkins, Danville, Va.

Filed June 4, 1976, Ser. No. 692,648
Int. Cl.[2] B44D 3/12; E06C 7/14
U.S. Cl. 248—210 **5 Claims**



1. Device for releasably suspending a paint can and brush from the side rail of a ladder within easy access of a painter thereon and for self-leveling the paint can comprising:

a. a receptacle including a paint can housing and a brush well;

b. a ladder clamping bracket with clamping means for releasably mounting said ladder clamping bracket to said side rail;

c. a receptacle support bracket attached to said ladder support bracket for free pivotal movement about a horizontal axis to form a self-leveling support, and including a hook-like hanger means for releasably suspending said receptacle therefrom;

d. said receptacle comprising:

i. a cylindrical can receiving housing having an open top and of such dimension as to receive a one-gallon paint can;

ii. a brush well including a generally rectangular housing having side walls and an open top of such relative size as to support brushes upright therein when not in use, and protruding from one side of the upper end of said can receiving housing; and

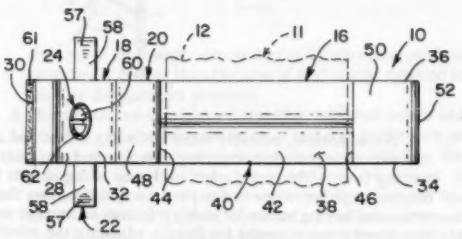
iii. said brush well housing being of such size and shape as to be suspended without fasteners from said hanger means with said brush well being positioned between said can receiving housing and said ladder side rail.

4,036,464

HEADSET HANGER

Steven W. Olson, 8011 N. New Braunfels, No. 117, San Antonio, Tex. 78209

Filed May 19, 1976, Ser. No. 688,034
Int. Cl.[2] A47F 5/08
U.S. Cl. 248—309 R **5 Claims**



1. A hanger adapted to be mounted on a wall or other surface for supporting a headset having a headband and a headphone coupled thereto with a cord surface to the headset comprising:

A. abutting means having a contacting surface for extending along a side of a wall or other surface;

B. support means for receiving the headband portion of the headset thereon and extending outwardly from said abutting means and having a pair of oppositely disposed side surfaces;

C. said support means has a concave curved support surface to approximately conform to the angle of curvature of the headband positioned thereon;

D. spaced apart retaining means extending upwardly from said support means for receiving the headband portion therebetween so as to contain said headband on said support means;

E. said spaced apart retaining means forms a receiving slot having a width slightly greater than the dimension of the headband therebetween, such that lateral movement of the headband on the holder is restricted;

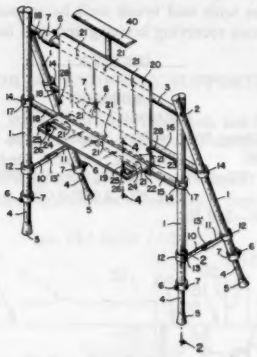
F. downwardly extending hook means for retaining the cord of the headset in place during storage, said hook means integrally formed with said abutting means;

G. said downwardly extending hook means includes a pair of spaced apart depending lugs terminating beyond said oppositely disposed side surfaces, each of said lugs having a downwardly extending inclined surface converging towards each other and forming an open top trough for the cord, such that to release the cord from its seated position, an upward movement is required to lift the cord above the open top of the trough, said lugs being in alignment with each other with said inclined surfaces substantially disposed in a plane normal to said contacting surface, and

H. coupling means in operative relation with said abutting

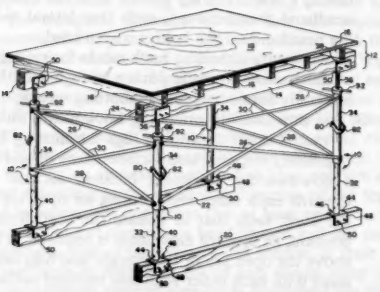
means for securing the holder in fixed position, such that said contacting surface of said abutting means engages the wall or other surface.

4,036,465
ADJUSTABLE STAND
Sam J. Kellner, 315 E. 69th St., New York, N.Y. 10021
Filed Feb. 9, 1976, Ser. No. 656,174
Int. Cl.[2] A47B 97/04
U.S. Cl. 248—463 **6 Claims**



1. An adjustable, portable stand including a first and a second pair of legs each comprising a jacket and a runner telescoping from within said jacket, each pair of leg jackets being fastened together at one end to permit angular motion therebetween and having means for stably effecting an angular separation therebetween; means for fixedly adjusting the telescoped length of each runner; a pair of cross bracing members each comprising a jacket and runner telescoping from within said jacket and disposed between said first and second pair of legs having a means for fixedly adjusting the length of each cross member; and a table having back plate fixed to said cross member jackets and a bottom plate joined to said back plate by a hinge permitting fixed angular movement therebetween.

4,036,466
FLYING DECK-TYPE CONCRETE FORM INSTALLATION
Richard A. Van Meter, Rolling Meadows, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Continuation-in-part of Ser. No. 426,965, Dec. 20, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,607
Int. Cl.[2] E04G 11/38, 11/56
U.S. Cl. 249—18 **2 Claims**



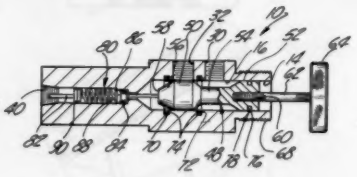
1. A unitary concrete form installation of the flying deck type, preadjustable to selected lengthwise and transverse dimensions and adapted to produce a horizontal building floor slab, said installation comprising, in combination a deck formwork adapted for forming a concrete slab thereon and including a pair of horizontally disposed front and rear longitudinally extending deck-supporting stringers spaced apart a selected distance, and scaffolding operatively supporting said stringers and consequently the formwork, said scaffolding comprising front and rear longituidnally extending base supporting sills of selected length disposed beneath said stringers respectively a pair of longitudinally spaced vertically disposed supporting posts extending between each of said sills and its associated stringer thereabove, said posts being disposed in quadrilateral relationship whereby each post on the front sill is traversely aligned with a corresponding post on the rear sill, each of said posts being of telescopic construction and including an inner lower tubular staff, an inner upper elevation screw, and an outer intermediate sleeve within which said staff and elevation screw are telescopically slidable, an inverted U-shaped saddle member supported on the upper surface of the sill beneath each post and having side flanges which straddle the sill and have performed nail holes therethrough, nails projecting through said nail holes and into the associated sill and serving fixedly to secure each saddle member in position on the associated sill, a pilot post projecting upwardly from each said saddle member, the lower end of each staff being telescopically received over the associated pilot post, a removable fastening pin projecting transversely through each pilot post and the associated staff and serving to secure the staff in position on the associated saddle member, a shore head on each post and having a socket-forming tube depending therefrom, a pilot stem on the upper end of each elevation screw and projecting into the asociated socket-forming tube, means releasably fastening each shore head to the associated stringer in supporting relationship, each said staff being formed with a series of vertically spaced pairs of diametrically opposed holes arranged in vertical rows on opposite sides of the staff, each said sleeve being provided with a pair of diametrically opposed holes in the lower region thereof and designed for selective register with the pairs of holes in the associated staff, a fastening pin projecting through said holes in each sleeve and through a selected pair of opposed holes in the associated staff, a nut threadedly received on each said elevation screw and slidably supported on the upper end of the associated sleeve for sliding rotation thereon, said nut being effective upon turning thereof in opposite directions to raise and lower the elevation screw to vary the effective length of the corresponding post, a pair of tubular cross braces of selected length extending longitudinally between each pair of said longitudinally spaced posts, a pair of tubular cross braces of selected length extending transversely between each pair of said transversely aligned posts, a pair of horizontally disposed vertically spaced apart tubular braces of selected length extending between each pair of transversely aligned posts and disposed on opposite sides of said cross braces extending between the transversely aligned posts, each of said cross braces and horizontally disposed braces extending continuously from one post to the other of the posts between which it extends, flattened ends on said braces having attachment holes therethrough, two vertically spaced apair pairs of threaded studs extending radially from each of said sleeves respectively adjacent to the upper and lower ends thereof, the studs in each pair extending at a right angle to each other and in vertically spaced apart relation, said studs projecting through said attachment holes, and wing nuts threadedly received on said studs and serving to hold the ends of said braces in position on the sleeves, thereby providing a form installation which may be transported as a single unit from one location to another for producing floor slabs in successive locations without dismantling the installation between locations and which may be dismantled following use.

4,036,467

VALVE

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed Apr. 23, 1975, Ser. No. 570,744
Int. Cl.[2] F16K *31/122, 31/60, 31/143*
U.S. Cl. 251—14 2 Claims



1. A valve comprising:
a housing having a through bore,
a fluid inlet bore intersecting said through bore,
a fluid outlet bore intersecting said through bore at a position longitudinally spaced from said inlet bore,
a control shuttle disposed in said through bore and axially movable between a first and second position, said control shuttle being operable to permit fluid communication between said inlet bore and said outlet bore when said control shuttle is in said first position, said control shuttle being operable to shut off the fluid communication between said inlet bore and said outlet bore when said control shuttle is in said second position;
a handle secured to said control shuttle for moving said control shuttle to said first and second positions, and
a hydraulic actuator responsive to an external hydraulic pressure and operable to shift said control shuttle from said first position to said second position when said external pressure exceeds a predetermined value whereby said control shuttle remains in said second position until returned by said handle to said first position, said hydraulic actuator comprising a piston disposed in said through bore and movable axially therein toward and away from said control shuttle, said piston being movable independently of said control shuttle, a second fluid inlet formed in said housing in communication with the side of said piston away from said control shuttle to move said piston toward said control shuttle upon a predetermined increase in the fluid pressure at said second fluid inlet, said piston having a portion engaging said control shuttle to move said control shuttle from said first position to said second position when said control shuttle is in said first position and said predetermined pressure has been produced at said second fluid inlet.

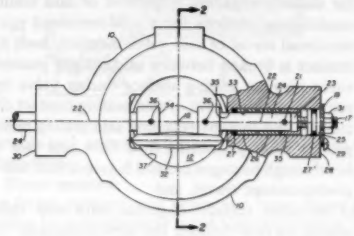
4,036,468

BUTTERFLY VALVE WITH SELF ENERGIZING SEAL

Anthony M. Webb, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Sept. 30, 1975, Ser. No. 618,126
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—84 6 Claims

1. An improved butterfly valve for unidirectional flow of fluid comprising:
a. a body having a substantially circular first opening therethrough, for the flow of fluid, and parallel faces perpendicular to the first axis of said first opening, one of said faces being an upstream face, and the other a downstream face, said housing adapted to be clamped between spaced parallel pipe flanges;
b. a second cylindrical opening through said body, the second axis of said second opening intersecting, and perpendicular to, said first axis, and shaft means journalled in said second opening;
c. a unitary circular ring seal means inserted and longitudinally immovably fixed in position by a shoulder into said body on said upstream face thereof, said seal means comprising a thin circular cylindrical ring of rigid material, and a circular ring of elastomeric material bonded to the internal surface of said cylindrical ring, at least part of the internal seating surface of said elastomeric material in the form of a cone, tapering toward said upstream surface, said conical surface tangent to a spherical surface centered at the intersection of said first and second axes; said elastomeric ring being constant in crosssection, and wedge shaped in crosssection with the wide portion of said wedge facing the high upstream fluid pressure; whereby



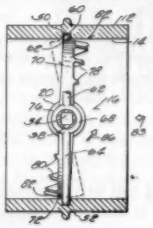
the area of said wedge exposed to said high upstream fluid pressure, is greater than the area of said wedge exposed to the low downstream pressure;
d. closure disc means rigidly fastened to said shaft means and having a circular face, the edge of said disc in the form of a ridge, the peak of which is circular in crosssection, the plane through said ridge, when said valve is closed, is perpendicular to and coaxial with said first axis and upstream a selected distance from said second axis, with said ridge in limited penetration of said conical surface of said elastomeric material; whereby said ring seal is self energizing.

4,036,469

BUTTERFLY VALVE

Daniel T. Robinson, Milwaukee, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.

Filed May 9, 1975, Ser. No. 575,934
Int. Cl.[2] F16K *1/22*
U.S. Cl. 251—306 4 Claims



1. A butterfly valve comprising
a body having a cylindrical bore defining a flow passage extending straight through said body;
a generally disc-shaped valve member including diametrically opposed, generally semicircular portions having a peripheral seating surface of spherical shape;
means supporting said valve member in said bore for rotation therein between an open position and a closed position to shut off flow through said flow passage;
a continuous internal groove in said bore including diametrically opposed, generally semicircular portions positioned to lie opposite respective of said valve member semicircu-

lar portions when said valve member is in the closed position;

a resilient sealing member disposed in said groove and including diametrically opposed, generally semicircular sections which are sealingly engaged by said valve member seating surfaces when said valve member is in the closed position;

a plurality of first and second axially extending fins respectively located on opposite sides of said valve member and respectively circumferentially spaced along the periphery of the opposite of said valve member semicircular portions, each of said fins having a curvilinear outer surface for slidably engaging respective of said sealing member semicircular sections for a predetermined portion of the rotational travel of said valve member, both after sealing contact is broken between said sealing member and said valve member seating surface during valve opening and prior to establishment of said sealing contact during valve closing, and thereby retaining said sealing member in said groove while permitting fluid flow past said valve member through passages defined between said fins during said predetermined travel, and

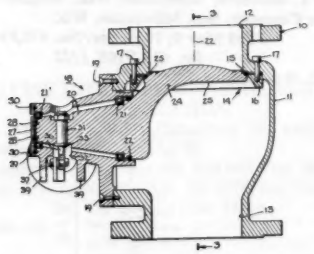
said fin outer surfaces together with said valve member seating surface defining the central segment of a sphere.

4,036,470

CANTILEVERED BALL VALVE

Henry Illing, Parksville, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Filed May 9, 1973, Ser. No. 358,830
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—309 **13 Claims**



1. A cantilevered ball valve comprising

a valve housing at least two openings for passage of fluid flow and an access opening,

a plate removably covering said access opening;

at least one annular valve seat mounted within said housing around one of said two openings, said valve seat being removably mounted through said access opening;

a spindle rotatably mounted in said housing on a longitudinal axis diametrically opposite said access opening, and

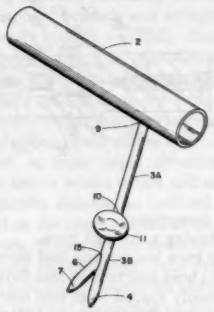
a valve body integrally formed on said spindle, said valve body constituting a cantilevered extension of said spindle having an annular seating surface on one side for sealing seating on said valve seat and a substantially flat surface on the opposite side, said extension extending from a peripheral portion of said spindle with said surfaces offset radially from said longitudinal axis of said spindle.

4,036,471

UPHOLSTERY AND THE LIKE STAPLE REMOVER

Timothy Darrell Allen, 567 Santiago Ave., and Weston Hamaker, 309 Arcade Blvd., both of Sacramento, Calif. 95815

Filed May 28, 1976, Ser. No. 691,097
Int. Cl.[2] B25C *11/00*
U.S. Cl. 254—28 **10 Claims**



1. A staple remover comprising:

a. A tubular handle,

b. A main shaft affixed to the handle at a point in from one end of said handle at about a 70° angle to the length of said handle in a plane that bisects the midpoint of said handle, said shaft terminating at the opposite end in two extending portions which are spaced apart from the other to define a longitudinally extending slit for receiving a staple, wherein said extending portions taken together from a cone with the apex thereof at the free ends of said extending portions,

c. A finger retaining mean secured at one end thereof to said shaft at about the midpoint of said shaft,

d. A secondary shaft affixed to said main shaft at an angle of about 35° horizontally and about 10° vertically from said main shaft, and positioned on the shaft on the side thereof corresponding to the longer portion of said handle, relative to the attachment of said shaft to said handle, said secondary shaft terminating in a cone at the opposite end thereof and having a slit bisecting the apex of said cone longitudinally.

4,036,472

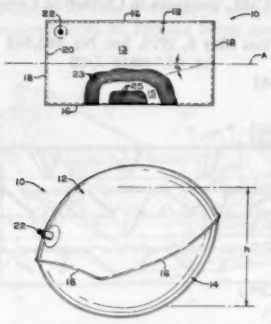
PNEUMATIC LIFTING DEVICE

Roy Lee Orndorff, Jr., Kent, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 9, 1976, Ser. No. 740,348
Int. Cl.[2] B66F *3/24*
U.S. Cl. 254—93 HP **6 Claims**

1. A pneumatic lifting device comprising a closed, flat, inflatable bag including upper and lower closely adjacent rectangular walls having length to width ratios greater than one, each of said walls comprising an even number of superimposed layers of rubberized, substantially mutually parallel cords, with

the cords in each layer disposed to extend at an acute angle of less than 55° relative to the longitudinal centerline of the wall



in which they are contained and in a direction opposite to the cords in an immediately adjacent layer.

4,036,473

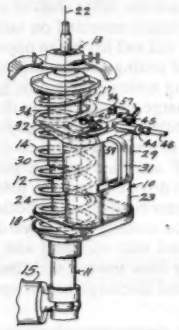
SPRING COMPRESSOR TOOL

Kenneth Donald Kloster, 5153 Rambo Lane, Toledo, Ohio 43623

Continuation of Ser. No. 547,918, Feb. 7, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,178

Int. Cl.[2] B23P *19/04*

U.S. Cl. 254—10.5 **10 Claims**



1. A spring compressor tool for compressing a spring having opposed ends comprising, an upper pressure shoe having a generally U-shaped helical portion including walls defining a spring receiving channel, a lower pressure shoe having a generally U-shaped helical portion including walls defining a spring receiving channel, a pair of fluid cylinders positioned between said upper and lower shoes, a pair of telescoping sleeves surrounding an end of each of said fluid cylinders and connected to one of such shoes, each of said cylinders including a cylinder body, a piston positioned to slide within said body, a piston rod attached to said piston and extending through one of said telescoping sleeves, and a cap connected to one end of the cylinder body, said cap defining therethrough a bore for slidably receiving said piston rod, said cap and said piston defining a chamber, a fluid header assembly positioned adjacent said telescoping sleeve, said fluid header assembly defining an inlet air passageway connected to said chambers and a vent passageway connected to said chambers, valving means for supplying air to said inlet air passageway and for venting said vent passageway to atmosphere, and spring return means positioned within said sleeves for urging said shoes apart.

4,036,474

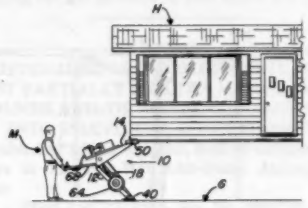
PORTABLE JACK

Vernon L. Owan, Highway Nos. 2 & 85 North, Williston, N. Dak. 58801

Filed June 15, 1976, Ser. No. 696,216

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—124 **19 Claims**



1. A portable jack apparatus for raising and lowering bulky objects, comprising:

a lower frame member;

an upper frame member, said upper and lower frame members being of approximately equal length and being pivotally attached together at a common transverse axis at their respective rearward ends;

an axially expandable and contractable lift means pivotally attached between said upper and lower frame members for alternatively pivoting said forward ends of said upper and lower frame members away from and toward each other about said common transverse axis to raise and lower said jack apparatus;

load support means on the forward end of said upper frame member for supporting a load on the jack apparatus;

base support means on the forward end of said lower frame member for supporting the jack apparatus as a load is being supported by said load support means;

drive means mounted on said jack apparatus for driving said lift means;

wheels rotatably mounted on said lower frame member between said base support means and said common transverse axis, the diameters of said wheels being proportioned and coordinated with their actual location of mounting such that the weight of the jack apparatus is carried by said wheels when no load is being supported by said load support means and is transferred to said base support means when a load is being supported by said load support means; and

elongated handle means extending in a rearward direction from a location adjacent to the rearward ends of said frame members and terminating in main control means for controlling said drive means at a position remote from said frame members whereby said jack apparatus can be manuevered into place under a load and operated by said main control means to engage the load and transfer support of the weight from said wheels to said base support means from a position spaced rearwardly of and away from said frame members.

4,036,475

DEVICE FOR INSTALLING CEILING INSULATION

O'Neal Singleton, 412 W. 7th St., Donaldsonville, La. 70346

Filed Sept. 30, 1976, Ser. No. 728,468

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—133 R **1 Claim**

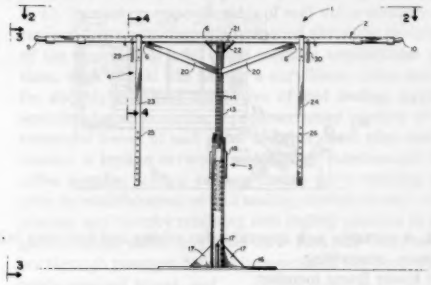
1. A device for lifting layers of insulation material in a position for attaching to a ceiling which comprises:

a. a support platform on which said layers rest, said platform having openings through which spikes fixedly attached to said ceiling can pass, said platform comprising parallel primary bars attached to and secured relative to one an-

other by secondary bars perpendicular to said primary bars;

b. a lifting assembly attached to said platform having means for raising said platform in position for attaching said layers on said platform; and

c. a securing means comprising at least two straps attached at one end to one of said primary bars; each strap having



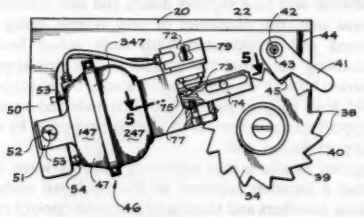
multiple openings at its other ends through which one end member of a releasing assembly can pass, said releasing assembly comprising a curved rod having one end member movably attachable to one of said primary bars and said other end member movably attachable and extending beyond another outside primary bar and through one of said multiple openings.

4,036,476

AUTOMATIC TAKE-UP WINCH

Donald R. Douce, 1517 Merced, Space 62, South El Monte, Calif. 91733, and Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Filed Feb. 25, 1976, Ser. No. 661,341
Int. Cl.[2] B66D *1/48*
U.S. Cl. 254—172 **16 Claims**



1. An automatic take-up winch comprising:

a reel element mounted for rotation about an axis and about which an elongated flexible member is to be wound;

a ratchet mechanism permitting rotation of said reel element in a take-up direction through a series of different positions and adapted to releasably prevent rotation of said element in a reverse unwinding direction from said different positions; and

a power unit including a power actuated part operable upon movement in one direction to turn said reel element in said take-up direction from one of said positions to another;

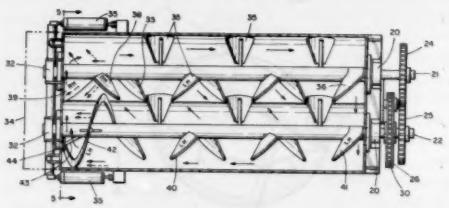
said part then being retractable in an opposite direction relative to said reel element in preparation for another take-up step, while the reel element is retained by said ratchet mechanism against rotation in said unwinding direction; said power actuated part being automatically operated to wind said flexible member to a desired tension when said part senses a slack condition in said flexible member.

4,036,477

MIXER

Benjamin Sieradzki, Berkeley, and John David Giese, Kensington, both of Calif., assignors to Chemetron Corporation, Chicago, Ill.

Filed May 6, 1976, Ser. No. 683,848
Int. Cl.[2] B01F *7/00*
U.S. Cl. 259—41 **8 Claims**



1. A mixer for mixing and discharging materials such as ground meat or the like, comprising:

a. an elongated tub having a discharge end;

b. means to selectively close said discharge end;

c. a pair of shafts mounted for rotation in said tub, said shafts having a plurality of spaced mixing paddles having the same hand pitch mounted thereon in an overlapping arrangement between said shaft centers, each mixing paddle being adapted, upon shaft rotation, to approach a complementary curved surface of said tub to clean same;

d. driving means connected to each shaft adjacent the end of said tub opposite the discharge end to drive one shaft in one direction and the other shaft in another;

e. a first mixing means mounted on said one shaft adjacent said discharge end and having an opposite hand pitch than the plurality of mixing paddles thereon; and

f. a second mixing means mounted on said other shaft adjacent said discharge end and having the same hand pitch as the mixing paddles thereon, whereby upon rotation of said one shaft, said first mixing means causing flow toward said discharge end and said mixing paddles causing flow toward the tub drive end and also toward said other shaft, and upon counter rotation of said other shaft, said mixing paddles thereon causing flow toward said discharge end and also toward said one shaft and said second mixing means causing flow toward said discharge end, for efficient mixing and discharge action upon opening said discharge end.

4,036,478

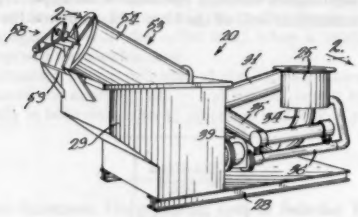
LIQUID QUENCHING SYSTEM

Jonathan Smith, Glen Ellyn, Ill.; Robert C. Larko, and Eugene E. Booth, both of Meadville, Pa., assignors to Sunbeam Equipment Corporation, Meadville, Pa.

Continuation of Ser. No. 488,548, July 15, 1974, abandoned.
This application Dec. 22, 1975, Ser. No. 642,875
Int. Cl.[2] C21D *9/62*
U.S. Cl. 266—133 **7 Claims**

1. A quenching apparatus for a heat treating furnace comprising a reservoir containing a liquid quenchant, a quench chute having an inlet end positioned to receive heated parts discharged from the furnace, a quench connector provided between the furnace and said quench said chute, a funnel member disposed in said connector, the lower portion of said funnel member extending into said quench chute, said quench chute having an initial downward portion and an upward-inclined portion terminating in an outlet end, said outlet end being in fluid communication with said reservoir, means supplying said quenchant from said reservoir to said quench chute, said means comprising a first conduit and a second conduit, said first conduit supplying quenchant by gravity flow and said second conduit including pump means for pumping additional

quenchant into said quench chute, both said first and second conduits supply said quenchant to said chute above said inlet end, said second conduit pumping quenchant into said chute through said connector below the top of said funnel member, said parts received from he furnace being quenched in said



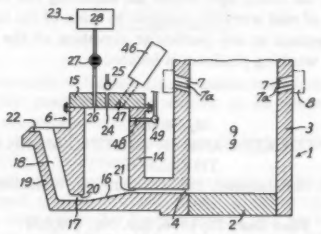
chute and conveyed through said chute by the quenchant, segregating means provided at said outlet end for receiving both said parts and said quenchant, said segregating means permitting return of said quenchant to said reservoir and providing continuous discharge of said parts substantially dry of said liquid quenchant.

4,036,479

CUPOLA FURNACE

Louis G. Chazé, Rennes, France, assignor to Centre Technique des Industries de la Fonderie, Paris, France

Filed May 12, 1976, Ser. No. 685,699
Claims priority, application France, May 20, 1975, 75.15668
Int. Cl.² C21B 7/14
U.S. Cl. 266—195 **8 Claims**



1. An improved cupola furnace system for controlling the tapping of pig iron without cutting off the blast and leaving the furnace tap hole constantly open, said cupola furnace comprising a hearth and a sidewall extending upwardly from the hearth for containing molten pig iron and slag up to a predetermined level, said sidewall having at least one tap hole at the level of said hearth and extending from adjacent said hearth to the exterior of said sidewall for removing molten pig iron from said furnace, said furnace also having a passageway extending from the interior of said sidewall to a point exteriorly thereof which is spaced upwardly from said hearth for removing slag from said furnace and having an air chamber and air-blowing tuyeres extending from said chamber to the interior of said sidewall at points above said predetermined level and said system further comprising:

a storage tank adjacent said furnace and having an upper end and a lower end and a first opening at said lower end, means connecting said tap hole with said opening in said lower end of said tank for the flow of molten pig iron from said furnace to said tank, said tank also having a second opening spaced from said first opening, the upper edge of said second opening being below the upper edge of said first opening, and having a siphon tube extending upwardly from said second opening for the flow of molten pig iron from said tank outwardly of said tube, said tube having a sill at the upper end thereof over which said molten pig iron flows when removed from said tank and said sill being located above said predetermined level;

means for sealing said upper end of said tank and thereby preventing the outflow of gas from said upper end thereof when said tank contains molten pig iron; and

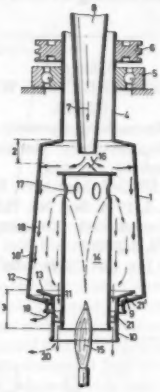
gas means connected to said upper end of said tank for changing the gas pressure in said upper end of said tank.

4,036,480

CENTRIFUGAL SEPARATION OF MIXTURES OF AT LEAST PARTIALLY MOLTEN METALS, METAL COMPOUNDS AND/OR METAL-CONTAINING SLAGS INTO INDIVIDUAL CONSTITUENTS

Willy Jakobs, and Alfred Kryczun, both of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 27, 1976, Ser. No. 680,775
Claims priority, application Germany, May 2, 1975, 2519622
Int. Cl.² C21C 7/00
U.S. Cl. 266—204 **6 Claims**



1. A mechanism for the centrifugal separation of hot materials such as mixtures of molten metals and slag comprising in combination:

a rotary housing drum having a separation chamber therein with an inlet for receiving material to be separated and with outlets at one end for the flow of separated materials;

means for rotationally driving the drum about an axis of rotation;

rotational support bearings for supporting the drum;

and a flame conducting heater shell within said chamber for heating the material being separated with opening means in the shell for the outlet of hot flame gases into the chamber with said heater shell being mounted to rotate with the drum.

4,036,481

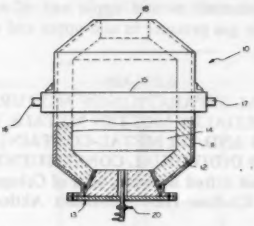
STEEL CONVERTER VESSEL TUYERE BLOCK CONSTRUCTION

Jai K. Pearce, Pittsburgh, Pa., and William Wells, Sydney, Canada, assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed June 14, 1973, Ser. No. 369,820
Int. Cl.² C21C 5/48
U.S. Cl. 266—222 **8 Claims**

1. A refractory lined metallurgical vessel for containing a quantity of molten metal to be treated, tuyere support means affixed in said refractory lining and comprising a hollow, tubular, metallic housing for receiving tuyere means, tuyere means disposed in said tuyere support means, said support means

extending at least partially through said lining and being constructed and arranged to position said tuyere means with its discharge end beneath the level of said molten metal, said tuyere means having a smaller cross-sectional area than and being is located within said housing to provide a gap therebe-



tween and a refractory material disposed in said gap, said tubular housing having one end disposed exteriorly of said nessel for receiving said tuyere means, and mounting means on the exterior end of said housing for securing said tuyere means therein.

4,036,482

APPARATUS FOR HARDENING WORKPIECES OF STEEL

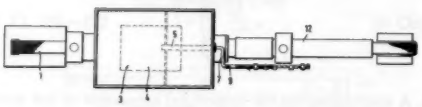
Wolfgang Kieferle, Ravensburg, Germany, assignor to Hawera probst Kommanditgesellschaft Hartmetall-Werkzeugfabric Ravensburg, Ravensburg, Germany

Division of Ser. No. 559,247, March 17, 1975. This application Aug. 4, 1976, Ser. No. 711,481

Claims priority, application Germany, Mar. 18, 1974, 2412982; Dec. 5, 1974, 2457605

Int. Cl.[2] C21D *1/06*

U.S. Cl. 266—252 **9 Claims**



1. An apparatus for hardening a workpiece of steel, which includes: a furnace comprising a furnace chamber, at least one gas retort extending into said furnace chamber for introducing a pressurized gas mixture of purified air and propane into said furnace chamber, said furnace chamber having an inlet and an outlet, a cooling section adjacent said outlet, endless conveyor means extending through said furnace and its furnace chamber and also through said cooling section for receiving workpieces to be hardened and carrying the same through said furnace chamber and said cooling section and subsequently discharging the cooled hardened workpieces, and adjustable transmission means associated with said conveyor means for setting and varying the speed of said conveyor means.

4,036,483

BLAST-FURNACE LINING ARRANGEMENT

Eberhard Böhmer, Heilshorn, and Wilhelm Hüsch, Bremen-Aumund, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

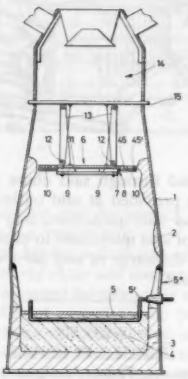
Filed Mar. 8, 1976, Ser. No. 664,809

Claims priority, application Germany, Mar. 12, 1975, 2510628

Int. Cl.[2] C21B *7/06*

U.S. Cl. 266—281 **12 Claims**

1. An arrangement for lining a blast furnace of the type having an upright circumference wall and a closed top together bounding an interior of the blast furnace which has different transverse dimensions at different elevations of the blast furnace, comprising a working platform; means for introducing said working platform into the interior of the blast furnace, including an opening through a lower region of the circumferential wall of the blast furnace; means for lifting and lowering said working platform in the interior of the blast furnace between different elevations of the latter, including transversely aligned through openings at an upper region of the circumferential wall of the blast furnace below the closed



top thereof, at least one support beam partly received in said through openings and extending transversely across the interior of the blast furnace, and means for suspending said working platform from said support beam for displacement toward and away from the latter; and means for adjusting the transverse dimensions of said working platform to those of the interior of the blast furnace at any particular elevation of the latter at which said working platform is located.

4,036,484

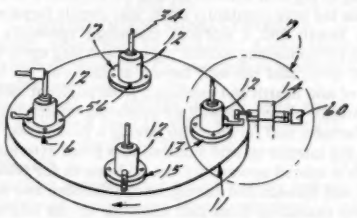
COLLET LOCKING AND OPERATING MECHANISM THEREFOR

Anthony K. Schneemann, 25761 Briarbank, Southfield, Mich. 48075

Filed June 21, 1976, Ser. No. 698,039

Int. Cl.[2] B23Q *1/16; 29 38 C*

U.S. Cl. 269—57 **8 Claims**



1. A clamping fixture comprising,

an angularly advanceable table having a plurality of fixtures thereon movable to a loading and working station,

each of said fixtures having a base containing a central threaded aperture,

a collet body having an external thread connected to the thread of the aperture,

a truncated conical head on the end of said body having a central aperture communicating with slots through the head to form sections,

a collet sleeve about said collet body having a truncated conical recess which receives said collet head,

and means to advance and retract said sleeve to clamp and unclamp the collet head, said means including an actuating pin movable normal to the collet, a transverse pin through said actuating pin extending through diametrical slots in said base and through diametrical disposed slots in the collet sleeve which are positioned at a small angle to provide a lock for securing the collet sleeve in locked engagement with the collet head when a workpiece is disposed therewithin, and

an actuating device provided at the loading station which moves the actuating pin of the fixture thereat longitudinally in both directions to unlocked and locked positions.

4,036,485

JIG

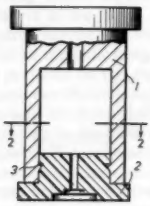
Rigobert Schimmer; Horst Gesing, both of Belecke; Wolfgang Beerwerth, Neheim-Husten, and Jürgen Messerschmidt, Belecke, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Division of Ser. No. 157,854, June 29, 1971, which is a continuation-in-part of Ser. No. 62,994, Aug. 11, 1970, abandoned. This application June 19, 1973, Ser. No. 371,371

Claims priority, application Germany, Aug. 11, 1969, 1940769

Int. Cl.[2] B23K *1/12, 3/00*

U.S. Cl. 269—285 **2 Claims**



1. A reusable soldering jig assembly including means for temporarily positioning components to be soldered to one another, comprising in combination:

a. a jig made of a plastic resistant to high temperature and reducing conditions; and

b. a steel cylindrical means for providing a handle on said jig; said steel cylindrical means being provided, at one end, with means for bearing against said jig for gripping said jig and holding said jig in a unitary assembly with said steel cylindrical means.

4,036,486

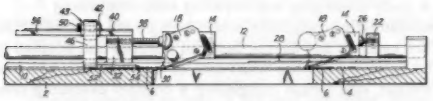
STOP MEANS FOR MAT BOARD CUTTER

Homer B. Molpus, Jackson, Mich., assignor to C & H Manufacturing Company, Jackson, Mich.

Filed Aug. 6, 1976, Ser. No. 712,157

Int. Cl.[2] B26D *5/08*

U.S. Cl. 269—303 **4 Claims**



1. In a mat board cutter having a base with abutment means for positioning a mat board thereon, a clamp bar for clamping the mat board on said base, a guide rail on said clamp bar for guiding a mat cutter therealong and a cutter-carrying body slidable along said guide rail, the improvement comprising:

a pair of stop blocks selectively adjustable along said guide rail on respectively opposite sides of said body and each having a stop member thereon in position to engage said body to predetermine the start and finish of a cut made by the cutter thereon, both said stop members being selectively adjustable, relative to said stop blocks, in a direction generally parallel to said guide rail, a first one of said stop blocks being adjacent said abutment means;

the other of said stop blocks having a positioning member thereon engageable with the edge of said mat board opposite said one edge, said positioning member being adjustably mounted on said other stop block.

4,036,487

SHEET FOLDING APPARATUS

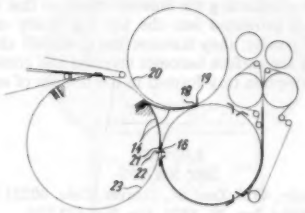
Paul Heimlicher, Bolligen, and Eduard Von Hein, Bern, both of Switzerland, assignors to Maschinenfabrik Wifag, Bern, Switzerland

Filed Sept. 9, 1975, Ser. No. 611,807

Claims priority, application Sweden, Sept. 12, 1974, 7411525

Int. Cl.[2] B65H *45/16*

U.S. Cl. 270—71 **3 Claims**



1. A process for producing a fold in a paper sheet comprising the steps of moving said sheet along a first rotary path upon first rotary means while the leading and trailing edges of said sheet taken relative to the direction of travel of said sheet along said path are supported upon said first rotary means, gripping a portion of said sheet along a line intermediate said leading and trailing edges thereof and withdrawing said gripped sheet by said gripped portion from said first rotary means to about a second rotary means while moving said sheet into a second rotary path about said rotary means to form in said sheet a fold extending transversely to the direction of travel of said sheet along said first path, and supporting and carrying said leading edge of said sheet by gripping said leading edge by third rotary means to hold said leading edge thereon while reversing the direction of travel of said leading edge during formation of said fold as said sheet is drawn along said second rotary path about said second rotary means, said leading edge being directed to move through a portion of a third rotary path defined by said third rotary means simultaneously with movement of said gripped portion of said sheet about said second rotary path.

4,036,488

CHANNEL RECEPTACLE TRAY FOR FINISHED PHOTOCOPIES

Charles B. Allen, 9446 214th Place, Queens Village, N.Y. 11429

Filed July 2, 1976, Ser. No. 702,248

Int. Cl.[2] B65H *29/00*

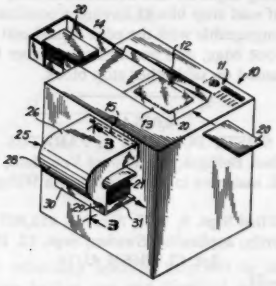
U.S. Cl. 271—186 **4 Claims**

1. A receptacle device for attachment to the copy output opening of a photocopy machine comprising:

a gravity chute comprising a C-shaped channel having an open upper and a lower end, the upper end of which covers the output opening of the photocopy machine for receiving the finished photocopies, said channel being dimensioned and configured to permit relatively free and uninhibited sliding of the photocopies therethrough, and including a first horizontal section having a length approximately equal to the length of the copies to be reproduced, a second curved section integrally formed with said first

horizontal section, said second curved section bending approximately 180°, and a third section substantially parallel with said first section and integrally formed at the bottom portion of said curved section, and

a receiving tray formed adjacent the opposite lower end of said C-shaped channel and adjacent to the bottom leg



thereof for collecting the finished copies so that when the copies are projected into the top leg, solely under the force of gravity, they traverse the C-shaped channel so that their top surface becomes inverted and comes to rest in the collection tray formed in the bottom of said channel.

4,036,489

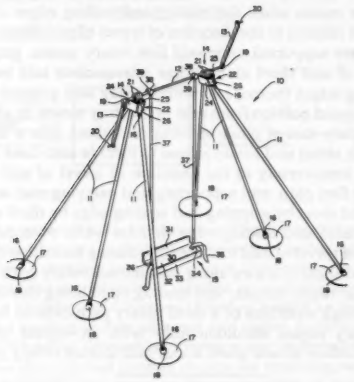
360° SWING

Istvan Potyondy, 4828 Zuni St., Denver, Colo. 80221

Filed Jan. 30, 1976, Ser. No. 653,726

Int. Cl.[2] A63G *1/20, 9/08*

U.S. Cl. 272—49 **6 Claims**



6. A 360° swing for the exercise and amusement of users thereof wherein the user can swing through any circular arc from 0° to 360°, the device comprising, in combination:

a pair of ground engaging upstanding support means;

a bearing and bracket assembly mounted at the top of each support means;

a top cross bar of a length greater than the distance between said bearing and bracket assemblies, supported thereby for rotation about its horizontal axis;

a crank handle rigidly affixed to each end of the top cross bar;

two spaced swing bars rigidly attached at their top ends to the top cross bar; and

a passenger supporting assembly rigidly attached to the bottom ends of said swing bars, with safety means associated with said passenger supporting assembly to prevent the passenger becoming detached therefrom in any position of said passenger supporting assembly, whereby the passenger together with the swing bars and passenger supporting assembly can swing through any circular arc from 0° to 360° by effort of the passenger, aided, as desired, by other individuals manually actuating the crank handles.

4,036,490

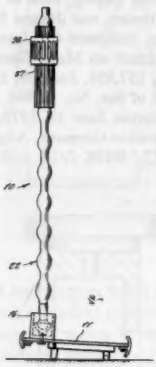
POLYTETRAFLUOROETHYLENE COATED EXERCISING POST KIT WITH REPETITIVE VARYING DIAMETER

Max Rice, 120 MacDougal St., New York, N.Y. 10012

Continuation-in-part of Ser. No. 569,460, April 18, 1975, Pat. No. 3,957,266. This application May 5, 1976, Ser. No. 683,492

Int. Cl.[2] A63B *23/00*

U.S. Cl. 272—67 **3 Claims**



1. A polytetrafluoroethylene coated exercising post kit with repetitive varying diameters, comprising in combination, an inclined platform, an upstanding post supported pivotally upon a ball and socket joint mounted upon said platform and a pair of removable pipes stored upon an upper end of said post; said post and pipes providing means for exercising various parts of a person's body; wherein said post is made of tubular metal sections interconnected together, an outer surface of said post being coated with polytetrafluorethylene and said post being formed with spaced apart bulbous enlargements throughout its length.

4,036,491

BODY MASSAGING AND REDUCING BELT

Frank C. Vierra, and Joyce L. Vierra, both of Maxwell, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Continuation of Ser. No. 579,615, May 21, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 666,125

Int. Cl.[2] A63B *21/12*

U.S. Cl. 272—119 **2 Claims**

1. A body massaging and reducing belt, comprising

a substantially trough-like means being a substantially belt-like member and having free end portions and adapted to be worn around the waist area of a user desiring to lose weight, said means comprising a channel extending continuously between said free ends, said channel being open upwardly and having a side that engages the body of the user; and

a plurality of balls in the trough-like member free to rotate therein and shifting in said member during movement of the waist area of a user to gently massage and tone the body of the user and to reduce the user's weight.

4,036,492
GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

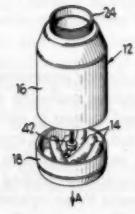
Filed Nov. 10, 1975, Ser. No. 630,721
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—1 R 5 Claims

1. A game apparatus, comprising:
a game board having a plurality of playing positions thereon;
indicating means at said playing positions on the game board in the form of letters of the alphabet capable of combining to define at least one word;
upwardly protruding means at the playing positions for covering by players of the game; and
a set of playing cards having alphabetical indicating means thereon identical to the indicating means at least at some of said playing positions on the game board whereby one player of the game can communicate the indicating means on a card from said set thereof and other players of the game can attempt to be the first to cover the upwardly protruding means at the particular playing position having indicating means thereat corresponding to the indicating means on the card so that the winning player can be awarded the card for spelling a word.

4,036,493
GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 23, 1975, Ser. No. 624,750
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—1 M 5 Claims

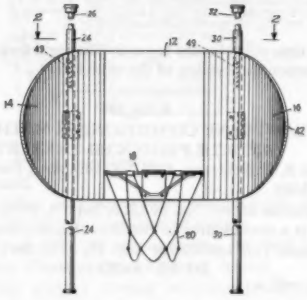


1. A game apparatus, comprising, in combination:
a container having an upper portion and a separable generally cup-shaped lower portion combining to define an interior cavity of the container, with the lower container portion defining the bottom of the interior cavity, and a deposit opening in one of the said container portions in communication with the interior cavity;
a plurality of playing pieces depositable into the interior cavity of said container through said opening so as to come to rest on the separable lower portion of the container; and
weight responsive release means in the form of attracting magnetic means between said upper and lower container portions to hold the same together but to release the separable lower portion from the upper portion in response to a sufficient number of playing pieces being deposited into the container, said attracting magnetic means including a permanent magnet fixed within the bottom of the cup-shaped lower container portion and an attractive permanent magnet fixed to means secured within the upper container portion and extending downwardly into the lower cotainer portion for positioning the permanent magnets in close proximity.

4,036,494
BASKETBALL GAME DEVICE

Thomas H. Hayes, 46 Evergreen Ave., Westport, Conn. 06880

Filed May 25, 1976, Ser. No. 689,939
Int. Cl.[2] A63B 63/04
U.S. Cl. 273—1.5 R 10 Claims



1. A basketball game device intended for use in a room of a home or the like, comprising in combination:
a. a basketball backboard assemblage including a central panel part, a hoop mounted on the front of the central panel part, said hoop being adapted to receive and pass a simulated resilient basketball thrown at said panel part, a pair of wing panel parts constituting side panels, and means hingedly attaching said wing panel parts at opposite side edges of the central panel part, to enable them to occupy different operative angular positions with respect thereto, and
b. demountable means adapted for engagement with surfaces of the room for mounting said assemblage in a high operative position in the room with the said wing panel parts extending from the side edges of the central panel part,
c. said demountable mounting means comprising two multipart telescoping poles, the parts of each pole being relatively movable and having means for maintaining their respective engagement with the floor and ceiling of the room.

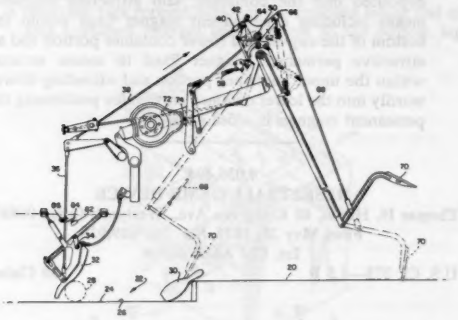
4,036,495
TIME DELAY MECHANISM FOR AUTOMATIC PINSETTING MACHINE

Thomas A. Blawn, 1898 Islip Ave., Central Islip, N.Y. 11722, and James F. Blawn, 190 Victory Drive, Lake Ronkonkoma, N.Y. 11779

Filed June 14, 1976, Ser. No. 695,769
Int. Cl.[2] A63D 5/00
U.S. Cl. 273—43 R 7 Claims

1. In an automatic pinsetting machine having a liftable cushion coupled through a cushion rod to a time delay means, said cushion adapted to sense the slightest impact of a bowled ball for cycling the pinsetting machine after a specified time delay, the improvement comprising an actuator, adjustably connected to said cushion rod, a micro-switch mounted adjacent said cushion rod, said actuator adapted to move with said cushion rod to close said micro-switch, a control circuit connected to said micro-switch for commencing the action of the time delay means and continuing the operation thereof after

said micro-switch receives an initial closing force, and a switching circuit in communication with said control circuit



and said time delay means for activating said time delay means to commence the cycling of the pinsetter.

4,036,496

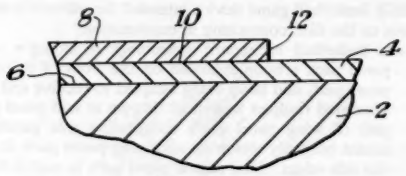
BOWLING LANE CONDITIONING METHOD AND ARTICLE PRODUCED THEREBY

Raymond B. E. Robinson, 4241 NE. 19th Ave., Fort Lauderdale, Fla. 33308

Continuation of Ser. No. 503,856, Sept. 6, 1974, abandoned, which is a continuation of Ser. No. 362,164, May 21, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,500

Int. Cl.[2] A63D *1/04*

U.S. Cl. 273—51 **2 Claims**



1. A process of conditioning the finished surface of a bowling lane comprising:

applying a solution consisting essentially of dimethylpolysiloxane of not less the 30,000 centistokes measured at 25° C. in a volatile carrier to said surface, and allowing said carrier to evaporate following said application step so as to leave a uniform coating consisting essentially of said dimethylpolysiloxane on said finished surface.

2. In a finished bowling lane and lane conditioner combination the improvement comprising:

a thin conditioner layer consisting essentially of dimethylpolysiloxane of not less than 30,000 centstokes measured at 25° C.

4,036,497

AMUSEMENT APPARATUS WITH A BALL DROP AND A ROTATING RECEPTACLE

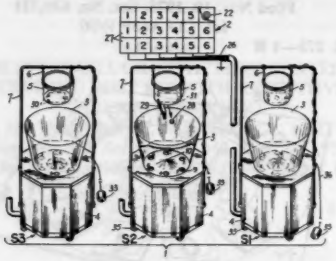
Joseph Benjamin Garto, 2240 E. 8th St., Brooklyn, N.Y. 11223, and Anthony Garto, 2075 Shore Parkway, Brooklyn, N.Y. 11214

Filed Oct. 7, 1975, Ser. No. 620,426

Int. Cl.[2] A63F *7/02*

U.S. Cl. 273—101 **7 Claims**

6. An amusement game of chance employing several players of each of whom plays at an identical station and each of which includes: token means disposed in a receptacle means, said receptacle means being formed of a pivotably releaseable retaining means, a rotatable receiving means disposed below said receptacle means, having a plurality of identifiable positions for receiving said token means; electrical switch means disposed in each of said positions for energizing display means connected thereto and corresponding to the respective position on said receiving means; release means governed by each of said players for releasing said token means from said retaining means, whereby said token means settles at respective positions in said rotating receiving means through the urging of a guide means centrally disposed in said receiving means, to thereby energize said electrical switch means.



4,036,498

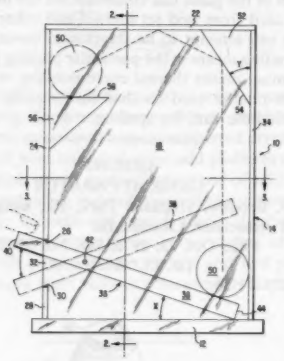
NOVELTY DISC MANIPULATING DEVICE

Burton D. Goldberg, 15109 Watergate Road, Silver Spring, Md. 20904

Filed Apr. 27, 1976, Ser. No. 680,844

Int. Cl.[2] A63B *67/06*

U.S. Cl. 273—101 **5 Claims**



1. An amusement device comprising:

an upstanding housing including a pair of spaced vertical side walls formed at least in part of transparent material;

a pivotally mounted operating lever;

said lever having an inner portion disposed in said housing and an outer portion projecting beyond said housing for digital engagement by an operator;

said housing including a top wall extending across said side walls at the top thereof;

said housing also including a first end wall extending between said side walls above the projecting outer portion of said lever and a second end wall extending between said side walls along the opposite end thereof;

a rebound member within said housing having an angularly disposed rebound surface extending between said top wall and said second end wall;

a support member within said housing including a support surface disposed beneath said top wall, said support member being attached to said first end wall; and

a disc disposed within said housing for free movement therein, said disc having a thickness less than and a diameter greater than the spacing between said side walls;

said disc ordinarily resting upon its edge on the inner portion of said operating lever, but said disc being propelled upwardly when digital pressure is applied to the outer portion of said operating lever to contact said rebound surface or said top wall or both and then to bounce toward said support surface,

said amusement device having as its objective the placement of said disc on said support surface through operation of said operating lever,

said rebound surface forming an angle between 30° and 45° with said second end wall,

said support surface having a flat surface parallel with said top wall,

said support surface being disposed within said housing at substantially the same elevation where said rebound surface intersects said second end wall.

4,036,499

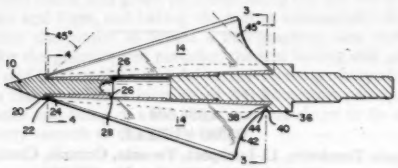
ARROW BROADHEAD

Donald D. Sherwin, 701 Madison, Port Richey, Fla. 33568

Filed Nov. 26, 1975, Ser. No. 635,708

Int. Cl.[2] F41B *5/02*

U.S. Cl. 273—106.5 B **4 Claims**



1. An improved arrow broadhead comprising in combination:

a rear ferrule adapted to be affixed to an arrow shaft having a collet with a tapered front undercut;

a front ferrule being a hollow tubular body with at least one longitudinal axial slot in its exterior surface, removably secured to one end of said rear ferrule coaxial thereto, and having a rear tapered section to substantially match said tapered front undercut of said rear ferrule, for close engagement therewith, and a front tapered section;

a removable blade placed in said axial slot, projecting from said front ferrule and being substantially the same longitudinal length as said front ferrule, and further having its rear end tapered to substantially match said tapered fron undercut of said rear ferrule, for axial wedging engagement therewith, and its front end tapered to be substantially flush with said front tapered section of said front ferrule;

a tip removable secured to said fron tapered section of said front ferrule and having a tapered undercut section to substantially match said front tapered section of said front ferrule for close engagement therewith and to substantially match said front tapered end of said blade, for axial wedging engagement therewith;

said axial wedging engagement of said blade with said tip and rear ferrule imparting through said front and rear end tapers of said blade, a transverse wedging engagement between said blade and said front ferrule;

whereby the tapered sections of the collet and the tip overlap and wedge the respective tapered ends of the blade to the front ferrule along the respective tapered sections of said front ferrule.

4,036,500

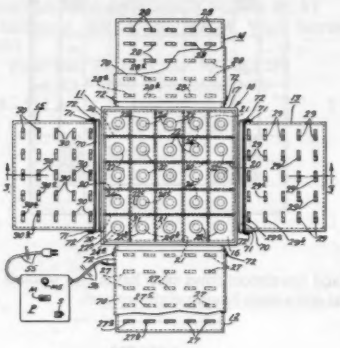
ELECTRICAL GAME DEVICE

James T. Kiernan, 2 Hamlet Road, Levittown, Pa. 19056

Filed Feb. 2, 1976, Ser. No. 654,477

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—130 AB **7 Claims**



1. A game device, comprising:

a game board,

means dividing said game board into a series of playing spaces arranged in a preselected pattern,

electrically-energizable means carried by said board for separately illuminating said playing spaces,

at least two playing stations associated with said game board,

a series of control switches corresponding in number to said playing spaces and having actuators mounted at each playing station,

circuit means electrically connecting the switches at one playing station with the switches at the other playing station and with said illuminating means for said spaces so that one switch at each playing station controls the illumination of one of said playing spaces, and

means for supplying electrical power to said circuit means to illuminate each playing space for which an odd number of its control switches are in an on position and to prevent illumination of each playing space for which an even number of its control switches are in on position.

4,036,501

BOARD GAME APPARATUS

John Hovnanian, 1530 Hancock St., Arlington, Mass. 02174

Filed Sept. 24, 1975, Ser. No. 616,270

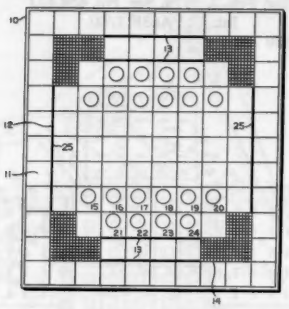
The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—131 K **1 Claim**

1. A board game apparatus comprising a board and two sets of playing pieces, each set consisting of a single large piece, a single piece of smaller size, another single piece of smaller size than the aforementioned piece, and 7 pieces smaller than the last mentioned piece; said board having on its surface two sets of lines parallel to the sides of the board, the lines of one set being perpendicular to those of the other set, whereby 110 squares of equal size are provided, 38 of said squares forming a continuous path around the periphery of the board, the remaining squares being within said path and forming a major playing area, having at each of its corners an area equivalent in size and shape to three squares, said areas being of distinctive appearance and forming an L-shaped figure, two rows of four squares each between legs of the L-shaped figures and adjacent the

inside top and bottom edges of the continuous path, the remaining 52 squares being arranged in seven rows, the upper-

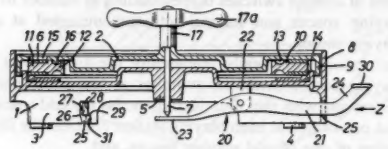


most and lowermost rows each having six squares and the five central rows each having eight squares.

4,036,502
INDICATOR DEVICE

Barnett Levy, 8 Esterbrook Street, Westminster SW1P 4NL, London, England

Filed Mar. 29, 1976, Ser. No. 671,447
Claims priority, application United Kingdom, Apr. 2, 1975, 13540/75; Aug. 21, 1975, 34841/75
Int. Cl.² A63F 5/04
U.S. Cl. 273—142 J **3 Claims**



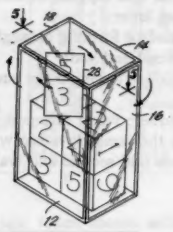
1. An indicator device comprising a base member, a ring positioned on said base member, a plurality of characters arranged around said ring, a spindle passing through said base member at the center of said ring, a disc carried by said spindle for rotary movement relative to said ring about the center of said ring, a handle on said disc for rotating said disc relative to said base member, indicating means on said disc for indicating one of said plurality of characters, cooperating locating means on both said disc and said ring, said locating means engageable with each other for locating said indicating means in register with any one of said plurality of characters at which said indicating means may stop, said ring locating means entraining said ring when both said locating means are engaged and a lever mechanism acting on said spindle for moving said disc away from said base member to disengage said cooperating locating means and enable spinning of the disc.

4,036,503
PUZZLE GAME

Martin Lance Golick, 217-02 75th Ave., Bayside, N.Y. 11364

Filed Jan. 28, 1976, Ser. No. 653,011
Int. Cl.² A63F 9/08
U.S. Cl. 273—153 S **7 Claims**

1. A manipulative puzzle game comprising a substantially rectangular parallelepiped box having a bottom, a top, opposed side walls, a front wall and a back wall, the side walls of said box being narrower than said front wall and said back wall, said front wall being transparent, and a plurality of identically shaped regular polyhedrons, said polyhedrons being disposed within said box in a plurality of juxtaposed stacks, the number of said polyhedrons being one less than the capcity of said box for such polyhedrons, whereby one of the stacks of polyhderons contains one less polyhedron than the balance of stacks or layers of polyhedrons, the width of the side walls of said box being slightly greater than the greatest distance between the vertices of opposed angles of a perimeter of a plane face of one of said polyhedrons, whereby careful manipulation of said box

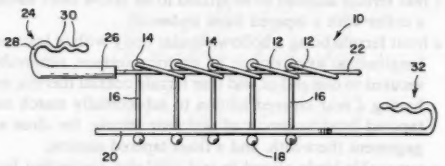


by horizontal twisting causes rotation of at least one of said polyhedrons about a central vertical axis, and the height of said box being slightly greater than the total height of one of the stacks of polyhedrons in said box to permit the upper polyhedron in said one stack to roll over about the vertex of a lower horizontal dihedral angle upon careful tilting of said box, at least one plane face of each of said polyhedrons bearing a visually distinguishing feature.

4,036,504
RING PUZZLE

Claude Touchette, 12 Lockport, Toronto, Ontario, Canada

Filed May 24, 1976, Ser. No. 689,176
Int. Cl.² A63F 9/08
U.S. Cl. 273—158 **2 Claims**



1. In a puzzle having a plurality of postlike members and a plurality of ring-like members, said ringlike members being articulately attached adjacent the corresponding ends of respective ones of said post-like members, and an elongated, closed loop-like member in interlocking engagement with respective pairs of said post-like and ring-like members so that said loop-like member can normally be disengaged from said post-like and ring-like members only be a series of prescribed manipulations of all of said members, the improvement comprising

a substantially U-shaped handle on one end of said loop-like member having separated portions for gripping by the thumb and fingers of one hand while the other hand manipulates said rings,

the other ends of said post-like members being connected to an elongated base member, and

a substantially U-shaped handle connected to one end of said base member,

said U-shaped handle on said base member being on the other end of said puzzle than said U-shaped handle on said loop-like member.

4,036,505

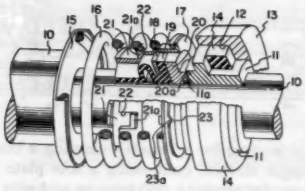
MECHANICAL SEALS

James R. Floyd; Paul N. Dalenberg, both of Saginaw, and Robert B. Slivensky, Bridgeport, all of Mich., assignors to The Wickes Corporation, San Diego, Calif.

Division of Ser. No. 442,186, Dec. 6, 1973, Pat. No. 3,969,451, which is a continuation of Ser. No. 143,789, May 17, 1971, abandoned. This application May 13, 1976, Ser. No. 686,039

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—96.2 19 Claims



1. A mechanical seal and seat assembly of the class wherein a relatively movable seal and seat therefor have confronting lapped sealing interfaces to seal off a fluid which wets the interface and wherein the seat has an interface microhardness in the range of at least about 200 kilograms per square millimeter, the seal being formed by homogeneously dispersing nonabrasive particles in a particulate matrix mix comprising hydrocarbon binder and graphite, compressing the mix and particles into seal form, and baking the seal to substantially dehydrogenize the binder to create a non-graphitic free carbon bond for the graphite and particles, the seal having said particles in said seal interface; and the particles having a microhardness in the range of at least about 200 kilograms per square millimeter and being of a size, hardness and shape to be nonabrasively smooth to the seat interface.

4,036,506

TILTABLE SLED

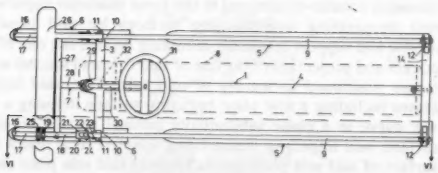
Rudi Scheib, Gartenstrasse 11, 7015 Korntal, Germany

Filed June 11, 1976, Ser. No. 695,285

Claims priority, application Germany, June 12, 1975, 2526169; Feb. 26, 1976, 2607748

Int. Cl.[2] B62M *27/02*

U.S. Cl. 280—21 A 24 Claims



1. A sled including a sled-contact-surface comprising:

a sled frame having two front steerable runners and two rear runners which are tiltable around canting axes running in the direction of travel each lying essentially parallel above the sled-contact-surface, said runners being connected with each other by at least one jointed-parallelogram which transfers canting motion;

steering elements connected to said sled frame with each said front runner being situated tiltably in one of said steering elements;

steering axles positioned essentially perpendicular to said sled-contact-surface, each of said steering elements being pivotable about a corresponding steering axle for steering motion relative to said sled frame; and

cardanic joints connecting each of said front runners with corresponding rear runners for the transferral of said canting motion with said steering axle being intersected by the canting axis of the corresponding front runners, the canting axis of the corresponding rear runners, and the joint axes of said corresponding cardanic joints.

4,036,507

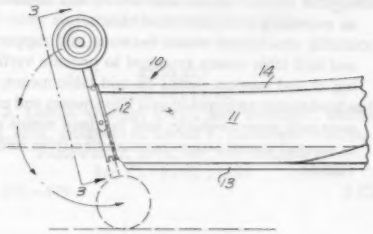
WHEELS AND ASSEMBLY FOR A BOAT

Eldon V. Henderson, Rte. 1, Box 204-H, West Sacramento, Calif. 95691

Filed Dec. 19, 1975, Ser. No. 642,253

Int. Cl.[2] B60P *3/10*; B63C *1/00*

U.S. Cl. 280—414 A 1 Claim



1. A wheel assembly for a boat comprising a substantially U-shaped framework for vertical attachment to the stern of a boat, a substantially Y-shaped support bar having a pair of spaced apart arms fitted inside said U-shaped framework and slidably mounted for movement along the framework and a leg extending from said arms, a plurality of wheels mounted on the outer end of the leg of the support bar, a pivot means extending through said U-shaped framework and through elongate slots in the ends of said arms, said arms pivotally mounting said support bar to said framework with said slots permitting the support bar to move along said framework, means for locking the support bar and framework together including a transverse pin across the arms of the support bar and a plurality of notches in the ends of the U-shaped framework, said notches being adapted to lockingly receive the transverse pin after the support bar moves and thereby hold the wheels in contact with the road or upwardly in the air, and a spring between the support bar and the U-shaped framework for resiliently separating the bar and the framework a distance equal to the elongated slots to thereby assist in inserting the pin in the notches.

4,036,508

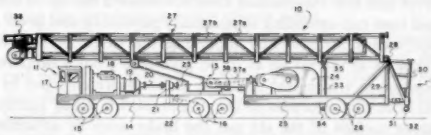
SELF-PROPELLED DRILLING AND WORKOVER RIG

Kenneth Harmon Eddy, and Kenneth Harmon McGill, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 25, 1974, Ser. No. 526,645

Int. Cl.[2] B60D *7/02*

U.S. Cl. 280—492 2 Claims



1. Self-propelled articulated mobile drilling apparatus transportable over uneven terrain to a remote drilling site, said apparatus comprising:

a power vehicle having front and rear axle sets thereon;

power generating means on said power vehicle adapted to propel said power vehicle;

a tandem vehicle attached to said power vehicle and having an axle set and a drawworks thereon;

rotatable compound attachment means attaching said tandem vehicle to said power vehicle and arranged to allow vertical and horizontal swivel movement simultaneously between said two vehicles;

a drilling mast structure carried on said tandem vehicle; and,

power transfer means on said two vehicles adapted to transfer power from said generating means to said drawworks

wherein said attachment means further comprises:

base plate means on said power vehicle;

table means rotatably mounted on said plate means and attached thereto;

elongated support means attached to said tandem vehicle an extending over said table means;

rotatable attachment means between said support means and said table means arranged to provide vertical flexing of said support means on said table means; and,

headrest means attached to said plate means and extending over said power vehicle; said headrest means arranged to support a mast structure extending from said tandem vehicle.

4,036,509

SKI BRAKE APPARATUS

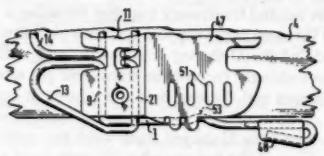
Gunter Schwarz, Steinacherstrasse 67, 8804 Au, Zurich, Switzerland

Filed July 11, 1975, Ser. No. 595,791

Claims priority, application Switzerland, July 17, 1974, 9863/74; Jan. 14, 1975, 478/75

Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—605 **18 Claims**



1. A brake apparatus for a ski comprising two brake elements, each brake element incuding a pivotable brake arm, a brake shaft extending substantially perpendicularly from the brake arm and forming a pivot axis for said brake arm, said shaft being arranged substantially parallel to the upper surface of the ski and transverse to the longitudinal axis thereof, spring loop means connected to said shaft and adapted to be engaged and deformed by a ski boot for actuating an associated brake arm, said spring loop means comprising a bracket having a bent end mounted at the ski and spaced forwardly of the brake arm pivot axis in a longitudinal direction toward the tip of the ski, said bent end extending substantially parallel to said pivot axis, and means for pivotally mounting the shafts of said brake elements at the ski so as to be pivotable from a preparatory position in which said spring loop means are engaged by said ski boot and deformed so that the bracket is urged against the upper surface of the ski and the brake arms lie adjacent the sides of the ski into a braking position in which said spring loop means are at least partly disengaged from said ski boot so that the bracket is spaced above the upper surface of the ski and the brake arms extend at least partly beneath the lower surface of the ski, each of said brake arms having an outer end positioned forwardly in the direction of the ski tip with respect to the pivot axis of such brake arm when the brake arms are in said preparatory position.

4,036,510

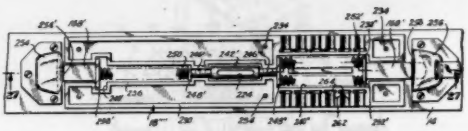
SAFETY SKI BINDING

Frank P. D'Alessio, Franklin Lakes, N.J., and Erl A. Koenig, Troy, N.Y., assignors to G P I, Franklin Lakes, N.J.

Division of Ser. No. 415,466, Nov. 13, 1973, Pat. No. 3,936,064, which is a continuation-in-part of Ser. No. 121,422, March 5, 1971, Pat. No. 3,838,866. This application Sept. 26, 1975, Ser. No. 617,230

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—613 **20 Claims**



1. A safety binding for releasably securing a boot to a ski having an upper surface, comprising a sole plate defining a housing; means for securing said boot to said sole plate; and first and second sets of means for releasably affixing said sole plate to said ski upper surface, said sets of means being shaped to permit both relative lateral and relative normal displacement of said ski and sole plate at both sets thereof, both of said sets of means including cooperative interengaging surfaces defining a pocket and a projection into said pocket, one of each of which surfaces is positioned on said ski and the other of each of which surfaces is positioned on said sole plate and the surfaces of each of which sets of means contact each other along an interfere shaped to cause said plate to be positioned laterally and normally relative to said ski upper surface in the region of both of said sets of means as said cooperating interengaging surfaces of each such set are concurrently impelled toward each other; means for impelling said surfaces in each of said sets toward each other concurrently, which impelling means includes front and rear plunger means mounted within said housing each of said front and rear plunger means defining, at an outer end thereof projecting forwardly and rearwardly respectively of said sole plate, one of said pocket and projection of each of said first and second sets of means respectively, said impelling means being sufficiently yielding to permit said cooperating interengaging surfaces of either of said sets of means to become disengaged from each other through relative displacement by motion having an axial component and either a lateral component, a normal component, or a combination of lateral and normal components due to the application of force moments counter-directional to the force moments imparted to said cooperating interengaging surfaces by said impelling means; and support means for mounting on said ski, one of said pocket and projection of the one of said first and second sets of means positioned forwardly of said sole plate, said support means including a sole plate engaging surface defining a convex curve in a plane substantially parallel to said ski upper surface, said impelling means being adapted such that a front surface of said sole plate normally abuts said sole plate engaging surface of said support means substantially in the region of the apex of the convex curve thereof when said sole plate is mounted on said ski to prevent forward motion of said sole plate during use.

4,036,511

CARBONLESS MANIFOLD BUSINESS FORMS

George E. Maalouf, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Division of Ser. No. 561,623, March 24, 1975, Pat. No. 3,981,523. This application Mar. 8, 1976, Ser. No. 664,941

Int. Cl.[2] B41L *1/36*; B41M *5/22*

U.S. Cl. 282—27.5 **6 Claims**

1. A manifold set of carbonless recording sheets, comprising:

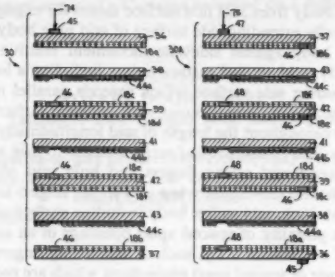
a stack including at least two superimposed sheets;

each of said sheets having on each of its surfaces, a coating

comprising an initially colorless color forming reactive component,

a reactive component of each of the coatings of one of said sheets being capable of reacting to produce a colored mark with a reactive component of each of the coatings of a second of said sheets upon coming into reactive contact therewith,

said one sheet being disposed in overlying relationship to said second sheet such that one of its coatings is disposed against one of the coatings of said second sheet, whereby



upon application of pressure to said stack, said one coating of said one sheet is forced into said reactive contact with said one coating of the second sheet to thereby produce a colored mark,

said sheets being capable of rearrangement such that said one sheet overlies said second sheet with its other coating disposed against the other coating of the second sheet, whereby upon application of pressure to said stack said other coating of said one sheet is forced into said reactive contact with said other coating of the second sheet to thereby produce another colored mark.

4,036,512

PIPE JOINTS

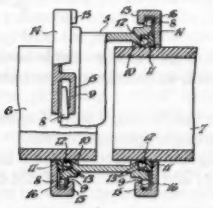
Robert Arthur Francis, 28 Skyline Drive, Keilor, Victoria, Australia

Filed Sept. 30, 1975, Ser. No. 619,972

Claims priority, application Australia, Oct. 1, 1974, 9113/74

Int. Cl.[2] F16L *17/00*

U.S. Cl. 285—111 **1 Claim**



1. A pipe joint for butt jointing of pipes comprising a sleeve adapted to receive and embrace the respective ends of pipes to be joined, a plurality of spaced apart radially projecting lugs at each end of the sleeve, said lugs having inner inclined wedging faces, and apertured closure for each end of said sleeve, spaced apart channeled flanges on said closures to engage the lugs on the sleeve to provide a bayonet type connection, said flanges being formed with stops to determine full engagement of said flanges with said lugs and being further formed with inner faces which are engaged by the wedging faces of said lugs; flanges integrally formed with said sleeve adjacent each end thereof and extending radially inwardly to form annular guides for said pipes, said flanges and the radially inner portions of said closures which are longitudinally spaced therefrom forming annular recesses about the pipe ends, resilient generally V-shaped sealing rings mounted in said annular recesses, each of said sealing rings comprising an annular groove defined by generally flat, inwardly directed peripheral lips and being formed with circumferentially spaced and radially arranged reinforcing webs, the inner surface of the outer flange of each closure bearing directly against the outer face of each respective sealing ring to press the sealing ring into said annular recess and effect initial sealing engagement of the peripheral lips with the sleeve and respective pipes, with the fluid pressure in the pipes resulting in continued sealing pressure being exerted on said peripheral lips to respectively sealingly engage the same with the adjacent inner surface of the sleeve and the adjacent outer surface of the respective pipes.

4,036,513

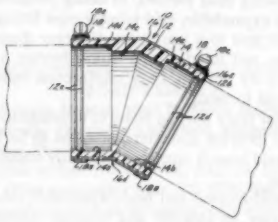
PIPE FITTING

Edward J. Loftus, Orange, Calif., and Gerald F. Hofberger, Peoria, Ariz., assignors to Gerald F. Hofberger, Peoria, Ariz.

Filed Feb. 2, 1976, Ser. No. 654,095

Int. Cl.[2] F16L *21/06*

U.S. Cl. 285—179 **3 Claims**



1. A pipe fitting comprising in combination:

a rigid sheet metal sleeve formed from two angularly disposed cylindrical portions the inner peripheral edges of which intersect and are joined along a common plane disposed transverse and at an angle to both cylindrical portions,

both longitudinal axes of the cylindrical portions lying in a single plane which is perpendicular to the common plane,

the adjacent cylindrical portions disposed in the single plane meeting at an obtuse angle which is bisected by the common plane,

a thick-walled annular resilient member disposed within and lining the sheet metal sleeve,

the end portions of the resilient member having an annular enlarged internal diameter section for receiving the ends of pipes,

the enlarged internal diameter sections extending inwardly such that a thickened central V-shaped section is left in the central section of the resilient member as viewed in the single plane, the angle included in the V-shaped section being the supplement of the obtuse angle,

the inner surface of the central V-shaped section being dimensioned to be in line with the internal surfaces of the two pipes to be received in the annular enlarged internal diameter sections so as to provide smooth uninterrupted liquid flow,

the sheet metal sleeve is split and the edges substantially overlap each other to provide for circumferential dimensional adjustment, and

clamping means comprising a circumferential clamp adjacent each free end of the sheet metal sleeve to provide firm gripping of the ends of the pipes which are inserted within the annular enlarged internal diameter sections of the thick-walled annular resilient member.

4,036,514

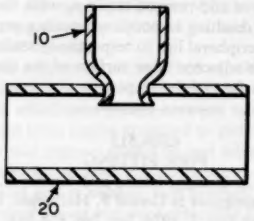
PIPE FITTING

Finn Hannover, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 265,993, June 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,465, Dec. 27, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,225

Int. Cl.[2] F16L *41/00*

U.S. Cl. 285—222 **6 Claims**



1. An article of manufacture comprising a tubular pipe fitting of unitary construction of solid organic polymeric material throughout, said solid organic polymeric material having the property, after being cold formed, of being permanently and irreversibly heat-expandable, said tubular pipe fitting for connecting a branch pipe to a main pipe of larger diameter than said branch pipe, sad tubular pipe fitting having a first and second tubular body portion, only said second tubular body portion being cold formed,

said first tubular body portion being of substantially uniform internal and external diameters, adapted to be bonded at one end to said branch pipe, and integrally connected at its other end to

said second cold-formed and heat-expandable tubular body portion having an internal and external diameter at its terminus which is less than the external diameter of said first tubular body portion and which is adapted to be inserted into an opening in said main pipe and, upon heating, expand permanently and irreversibly to increase the internal and the external terminus diameters; to directly tightly engage said opening and firmly interlock with said main pipe.

4,036,515

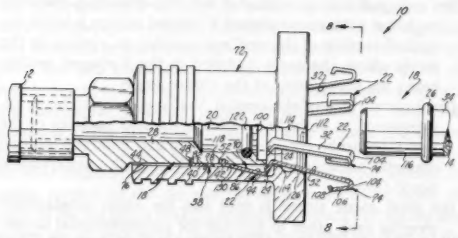
COUPLING ASSEMBLY

Thomas D. Karcher, Rocky River, and Richard J. Silagy, Parma, both of Ohio, assignors to The Hansen Manufacturing Co., Cleveland, Ohio

Filed Jan. 14, 1976, Ser. No. 649,092

Int. Cl.[2] F16L *37/18*

U.S. Cl. 285—315 **21 Claims**



1. A coupling assembly for connecting a pair of conduits in fluid communication, said coupling assembly comprising a socket body adapted to be connected with one of said conduits, said socket body including means for defining a socket chamber, a plug body adapted to be telescopically received in said socket chamber, said plug body having a longitudinally extending side surface and an annular retaining surface, a plurality of longitudinally extending spring fingers connected with the said socket body and resiliently deflectable sidewardly between an engaged position holding said plug body against axial and sidewise movement relative to said socket body and a disengaged position in which said spring fingers are ineffective to hold said plug body against movement relative to said socket body, each of said spring fingers including first surface means for engaging said annular retaining surface on said plug body to hold said plug body against axial movement relative to said socket body and a second surface means connected with and extending away from said first surface means for engaging said longitudinally extending side surface of said plug body to hold said plug body against sidewise movement relative to said socket body, said second surface means including a longitudinally extending side surface which extends parallel to and is disposed in abutting engagement with said side surface of said plug body throughout the length of said longitudinally extending side surface of said second surface means to grip said plug body between said spring fingers and hold said plug body against sidewise movement when said spring fingers are in said engaged position, said socket body including surface means for defining a plurality of spaced apart openings in an outer side surface of said socket body, each of said spring fingers having at least a pair of spaced apart projections which are received in said opening in said outer side surface of said socket body to retain said spring fingers against axial movement relative to said socket body.

4,036,516

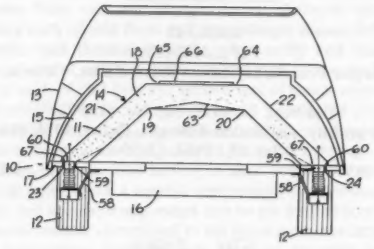
SAND DISPENSING DEVICE FOR A MOTOR VEHICLE

Frank Oldham, 113 Green Ave., Hempstead, N.Y. 11550

Filed July 7, 1975, Ser. No. 593,877

Int. Cl.[2] B60B *39/06*; B61C *15/10*

U.S. Cl. 291—38 **2 Claims**



1. A sanding device for a motor vehicle having a pair of rear wheels, a floor board, an interior compartment, and a trunk, which comprises:

a. a sand storage unit having a pair of open ends and a top base with a threaded aperture therein;

b. hollow rectangularly shaped members having open ends affixed at one of said ends to each of said open ends of said storage unit;

c. cylindrical sleeve members affixed linearly to one of said other open ends of each of said rectangularly shaped members, each said sleeve member adapted to be received through said floor board;

d. chute assemblies affixed linearly onto each of said sleeve members, each of said chutes disposed below said floor board;

e. dispensing unit assemblies affixed linearly onto each of said chute assemblies;

f. means for opening and closing each said dispensing unit, wherein each said dispensing unit has a closed bottom base and a movable end wall, said movable end wall of each said dispensing unit affixed to one end of one of a plurality of cables, said movable end wall of each said dispensing

unit being rotated upwardly by application of tension to each said cable;

g. a common cable element, one end of said common cable element joined to said other end of each said cable within an interior of said motor vehicle;

h. a lever arm having a handle end and a cable mounting end rotatably adapted to be mounted at its center onto a central hub of a steering wheel, said cable mounting end of said lever arm joined to another end of said common cable element; and

i. a tension spring joined between said cable mounting end of said lever arm and a C-clamp mounted on a steering column.

4,036,517

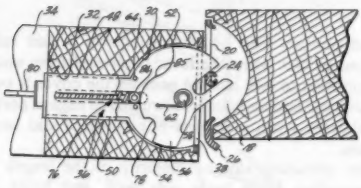
ROTARY DOOR LATCH

Samuel I. Talmadge, 1350 Almayo Ave., Los Angeles, Calif. 90064

Continuation-in-part of Ser. No. 577,180, May 14, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,111

Int. Cl.² E05C *19/02*

U.S. Cl. 292—216 **14 Claims**



1. A door closure for latching a hinged door to a door jamb, comprising a striker plate on the jamb having a surface tangent to the arcuate path of the outer edge of the door, the striker plate having a pair of openings forming a vertically extending post between the openings and a lip extending beyond the edge of the jamb in the direction that the door swings open, a latch assembly mounted on the door along the outer edge opposite the position of the striker plate, the latch assembly including a frame recessed in the door, a rotary latch member pivotally supported in the frame for rotation about a vertical axis, the latch member being rotatable between an open and a closed position, the latch member having a portion projecting beyond the edge of the door toward the jamb when the latch is in the open position, the projecting portion having a surface extending outwardly in a direction away from the pivot at small angle in a direction away from the jamb to produce a wedging action when brought into contract with the lip of the striker plate as the door is moved toward the closed position, the movement of said surface of the projecting portion against the lip of the striker plate causing the latch member to rotate about said vertical axis, the rotary latch member having a notch opening radially outwardly from the pivot in a direction parallel to the edge of the door when the latch is in the open position, the relative movement between the door and striker plate rotating the latch member so that the post engages the notch causing continued rotation of the latch member to the closed position as the door swings fully shut, and releasable detent means locking the latch member in the closed position.

4,036,518

DOOR BRACE

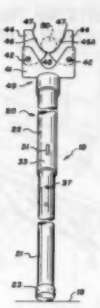
Eduard Jost, 656 E. 45th Ave., Vancouver, British Columbia, Canada (V5W 1Y7)

Filed June 21, 1976, Ser. No. 697,993

Int. Cl.² E05C *17/54*

U.S. Cl. 292—339 **2 Claims**

1. A brace for a door comprising a telescopic rod having upper and lower ends, means for selectively adjusting the length of the rod, a floor-gripping member on the lower end, a head fitted to the upper end, a pair of jaws mounted on the head, pivot means securing each jaw to the head for swinging movement between handle-gripping and handle-releasing positions, said pair of jaws having opposing edges provided with non-skid surfaces, said opposing edges having opposite curvature and being spaced with respect to the pivot means whereby a force applied to open the door tends to tighten the grip of the pair of jaws upon the handle.



4,036,519

STREAMLINING APPARATUS FOR ARTICULATED ROAD VEHICLE

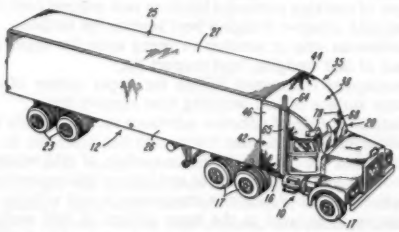
Ronald A. Servais, Dayton; Paul T. Bauer, Bellbrook, and Alan F. Meckstroth, Dayton, all of Ohio, assignors to Aerospan Corporation, Dayton, Ohio

Continuation of Ser. No. 500,075, Aug. 23, 1974, Pat. No. 3,945,677. This application Mar. 17, 1976, Ser. No. 667,632

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Int. Cl.² B62D *35/00*

U.S. Cl. 296—1 S **10 Claims**

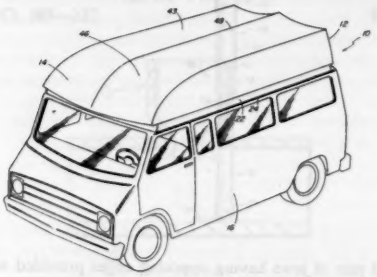


1. Apparatus for mounting on a wheel supported road vehicle to streamline the flow of air past the vehicle and to reduce the aerodynamic drag on the vehicle, said apparatus comprising an air enclosure member defining an air chamber and including a flexible wall, means for mounting said enclosure member on the vehicle in a position where said flexible wall projects outwardly from the vehicle and is exposed to the flow of air past the vehcile when the vehicle is moving forwardly along a road, said flexible wall being capable of collapsing inwardly in response to the pressure exerted by the flow of air past the vehicle, means defining a ram air inlet for said air enclosure member, said air inlet being positioned to receive a small portion of the air flowing past the vehicle for pressurizing said chamber with sufficient pressure to avoid collapsing of said flexible wall, and the forward projected area of said inlet is substantially small relative to the forward projected area of said air enclosure member to minimize aerodynamic drag associated with said air inlet.

4,036,520
COMBINATION RECREATIONAL VEHICLE ATTACHMENT

Samuel J. Zuidema, 87 Bearfoot Road, West Milford, N.J. 07480

Filed May 10, 1976, Ser. No. 685,032
Int. Cl.[2] B60D 3/10
U.S. Cl. 296—23 B 17 Claims



1. A recreational vehicle boat-roof structure attachment situated in place of and out of the plane of the original vehicle roof wherein; after removal of substantially all of the original vehicle roof, a perimeter strip of said original roof remains which merges into a perimeter drip rail channel concavity comprising in combination:

a boat structure dimensioned to cover said vehicle roof area;

a boat lip extending around the perimeter of the gunwhale of said boat structure being in a perpendicular relation to and displaced a slight distance from the gunwhale edge;

a wedging boat support lip extending continuously about the perimeter of and resting upon said original roof strip, wedging boat said support lip having a concave lower surface, conforming to the slope of said original roof, and three flat surfaces, an outer surface and said concave surface merging into a narrow edge which rests in said drip rail channel concavity;

securing means to extend through said outer and concave wedging boat support lip surfaces into said original roof strip;

a layer of caulking substance between said original roof strip and said concave wedging boat support lip surface;

a continuous strip of weather stripping upon the upper surface of said wedging boat support lip;

a rectangular indentation within the upper corner of said outer surface of said wedging boat support lip;

a continuous strip of adhesive substance secured within said rectangular indentation;

latch means secured to the inner surface of said wedging boat support lip to attach to and secure said recreational vehicle boat-roof structure attachment to said vehicle; and

roller means secured to the inner surface of said wedging boat support lip, being placed near the rear of said vehicle to accommodate said gunwhale edge and to assist removal of said recreational vehicle boatroof structure attachment when moved 90° from the rest position.

4,036,521
TRUCK COVER ASSEMBLY

Alain Jean-Marie Clenet, 369 Paseo de Playa No. 111, Ventura, Calif. 93001

Filed Dec. 23, 1974, Ser. No. 535,365
Int. Cl.[2] B60P 7/02
U.S. Cl. 296—100 4 Claims

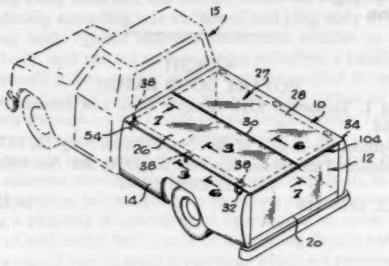
4. Apparatus for covering an open body of a truck that has opposite truck body sides comprising:

a cover formed of flexible sheet material and having first and second opposite outer edge portions and an inner portion between said outer edge portions; and

first and second mount means for mounting the respective outer edge portion of said cover on the opposite truck body sides;

said first mount means including a lever having innner and outer lever portions, means for pivotally supporting the inner lever portion, and a plurality of latches spaced along the length of said lever, each engagable with only one location along said lever;

said outer lever portion being attached to said first outer edge portion of said cover and said lever being pivotable between a release position and a latched position, said outer lever portion of said cover lying further from said second outer edge portion when said lever is in said latched position than when said lever is in said release position, so that when the lever is pivoted from said release position to said latched position the cover is pulled taut, and said latches being constructed to engage portions of said lever when said lever is pivoted to said latched position;

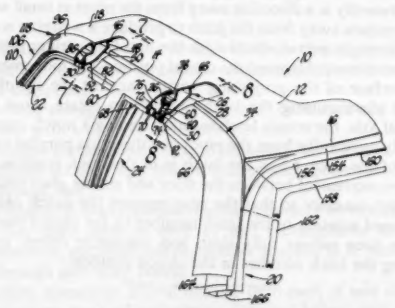


said lever extending along a majority of the length of a corresponding truck body side wall, and being constructed so it can twist 90° along its length without permanently deforming, whereby different locations along said lever can be separately pressed into engagement with a latch to facilitate moving the entire lever to its latched position.

4,036,522
VEHICLE BODY ROOF CONSTRUCTION

Delbert D. DeRees, Utica, Mich., and Jacques Emile Pinsonneault, Windsor, Canada, assignors to American Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1976, Ser. No. 673,174
Int. Cl.[2] B60J 9/00
U.S. Cl. 296—154 24 Claims



12. A vehicle body roof construction comprising: a roof panel including a first edge portion for defining the upper extremity of a longitudinal opening and a second edge portion that has a juncture with the first edge portion and defines a lateral side extremity of the roof; a pillar for supporting the roof panel at the juncture of the edge portions thereof and including pillar inner and outer members that define an enclosed chamber; each of said pillar members including first and

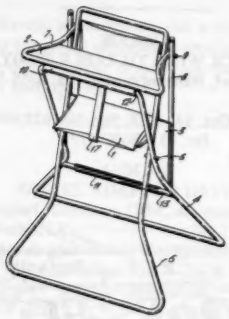
second portions that respectively project along the first and second edge portions of the roof panel in a spaced relationship to each other; said first and second projecting pillar portions including depressions where the pillar inner and outer members are interengaged along the cross sections of the projecting portions and welded to each other in a spaced relationship from the juncture of the roof panel edge portions so as to enclose the chamber defined between the pillar members and to provide a pillar capable of interconnecting a header member along the first roof panel edge portion and a roof rail member along the second edge portion of the roof panel without requiring the pillar inner member to have any access welding holes.

4,036,523

CHILD'S CHAIR

Knud Nielsen, Mosebakken 16, 2830 Virum, Denmark

Filed Sept. 22, 1975, Ser. No. 615,877
Claims priority, application Denmark, Sept. 25, 1974, 5055/74
Int. Cl.[2] A47C *4/00*
U.S. Cl. 297—130 **16 Claims**



1. A collapsible child's chair comprising first and second, generally planar frames each having opposite ends, pivot means pivoting said frames together intermediate their opposite ends for pivoting movement between an erect and a collapsed condition, first and second substantially rigid linking means each securable to both of said frames to maintain said frames in said erect condition, each said first and second frames having portions extending to opposite sides of said pivot means, each of said linking means being connected to one of said frames at a portion thereof at one side of said pivot means and one of said linking means being connected to the other of said frames at portions thereof on opposite sides of said pivot means, at least one of said linking means having one end thereof permanently and pivotally secured to said frames and the other end thereof being releasably secured to the other of said frames and at least one end of the other of said linking means being releasably secured to one of said frames.

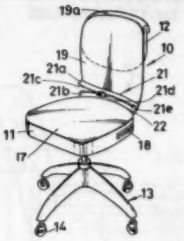
4,036,524

CHAIR

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1976, Ser. No. 651,402
Claims priority, application Japan, Feb. 6, 1975, 5017107[U]
Int. Cl.[2] A47C *27/00*
U.S. Cl. 297—219 **2 Claims**

1. In combination, a chair having a seat with an upper surface and a free rear upper marginal edge, support means depending from said seat, a back-rest supported in spaced relation above said seat and in general alignment with the free rear upper marginal edge of said seat, said back-rest having a free upper edge and a free front face, a single sheet protective cover of a width substantially equal to the width of the back-rest, said cover having a top edge engaged with and over the free upper edge of the back-rest, and a lower edge generally paralleling the free rear upper marginal edge of the seat in adjacent spaced relation thereabove, a separable sliding clasp fastener comprising a pair of stringers, one of said stringers being secured to and along said lower edge of the cover and depending therefore, the second of said stringers being secured to the free rear upper



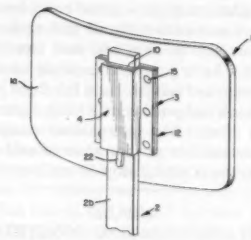
marginal edge of said seat and extending upwardly therefrom, said sliding clasp fastener further including a slider releasably interlocking said stringers, and thereby said back-rest cover and said seat, and providing a continuous exposed surface between the back-rest and the free upper marginal rear edge and upper surface of the seat.

4,036,525

BACKREST ADJUSTMENT MECHANISM

Victor G. Howk, Sturgis, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio

Filed Apr. 8, 1976, Ser. No. 674,959
Int. Cl.[2] A47C *1/00*
U.S. Cl. 297—353 **9 Claims**

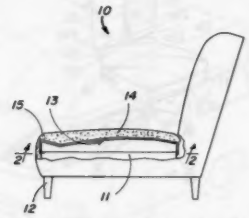


1. A mounting and adjustment assembly for attaching a rest member to an upright post member including, a housing secured to said rest member, said housing provided with a vertical channel juxtaposed said rest member, said post member slideably disposed within said channel, displaceable actuating means disposed within said housing channel, said actuating means provided with catch means, attachment means within said housing channel securing said actuating means therein and allowing limited displacement thereof, said attachment means comprising a planar retainer plate fixedly disposed within said housing channel, said plate provided with a cutout including an arcuate bearing section, said actuating means comprising a lever having a planar circular bearing portion journalled within said plate bearing section, said lever catch means projecting from the plane of said circular bearing portion toward said post member lock means, a plurality of lock means on said post member, spring means normally urging said catch means to engage one said lock means to immobilize said rest member relative said post member and a finger portion on said lever accessible from outside said housing and manually operable to displace said catch means against the force of said spring means to disengage said catch means from said post member lock means to allow vertical adjustment of said rest member relative said post member.

4,036,526
FURNITURE SPRING SUPPORT

William G. Baechle, 1710 Russell Ave., Evansville, Ind. 47712, and Edward L. Roehm, B-4 Old Courthouse, Evansville, Ind. 47708

Filed Aug. 16, 1976, Ser. No. 714,775
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—452 10 Claims



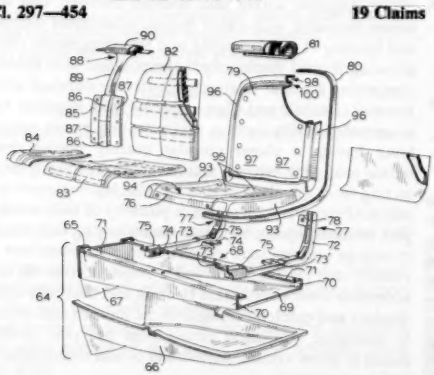
1. A spring support for a piece of furniture comprising:

a plastic sheet to be incorporated into a piece of furniture, said sheet extending laterally across to form a seat and including a generally center portion to supportingly receive a person with said center portion having a generally curved convex configuration as viewed from above, said sheet further including a front end portion and a first intermediate portion between said front end portion and said center portion and further including a back end portion and a second intermediate portion between said back end portion and said center portion, said sheet including a straight longitudinal axis extending from said front edge portion to said back edge portion, said first intermediate portion and said second intermediate portion being integral with said center portion and being located along said longitudinal axis outwardly of said center portion, said first intermediate portion and said second intermediate portion each having a cross sectional area less than said center portion and less than said front end portion and less than said back end portion providing a greater downward deflection of said first intermediate portion and of said second intermediate portion than of said center portion when a person is sitting atop of said center portion.

4,036,527
TRANSPORTATION SEATING CONSTRUCTION AND SYSTEM

Thomas L. Faul, Toronto, Canada, assignor to Otaco Limited, Orilia, Canada

Filed Oct. 15, 1975, Ser. No. 622,652
Claims priority, application United Kingdom, Apr. 10, 1975, 14858/75
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—454 19 Claims



1. A frameless, stressed skin seat construction adapted for direct attachment without frame members either to others of its kind or to a support component, comprising:

an integral sheet metal seat pan formed to define (a) inverted U-shaped portions at opposite side for contributing beam strength to the sides, (b) a convex upward cylindrical surface spanning the front for providing load supporting capability to the front, and (c) a concave upward dished portion in the rear half of the seat pan for providing torsion resistance to the seat pan as a whole;

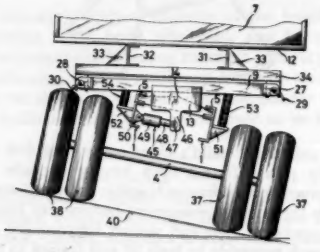
an integral sheet metal back pan formed to define (d) rearward opening U-shaped portions at opposite sides for contributing beam strength to the sides (e) a concave forward dished portion in the lower half of the back pan for providing torsion resistance to the back pan as a whole, and (f) a rearwardly opening U-shaped channel at the top for providing beam strength to the top;

the seat pan and back pan being secured together such that the securement is weaker than the pans themselves, whereby sufficient force exerted to fold the pans together will cause buckling of the securement rather than bending of said pans.

4,036,528
TRUCK WITH TILTABLE BODY

Heinrich Langendorf, Bahnhofstrasse 115, 4355 Waltrop, Germany

Filed Oct. 14, 1975, Ser. No. 622,065
Int. Cl.[2] B60P 1/16
U.S. Cl. 298—17 S 7 Claims



1. A tipping vehicle comprising a chassis and a tipping body which initially rests on a front frame member and can be inclined backwards by pivoting about a rear axis contained in a rear tipping member by means of an elevating mechanism mounted on the chassis, the rear tipping member being mounted on the chassis for pivotal movement about an axis extending in the longitudinal direction of the vehicle and drive means for pivoting the rear tipping member being coupled between the rear tipping member and the frame, whereby after the tipping body has been lifted from the front frame member, the rear tipping member and the elevating mechanism pivot until the transverse direction of the tipping body is horizontal, said drive means comprises at least one thrust piston unit pivotally connected both to the rear tipping member and to the chassis.

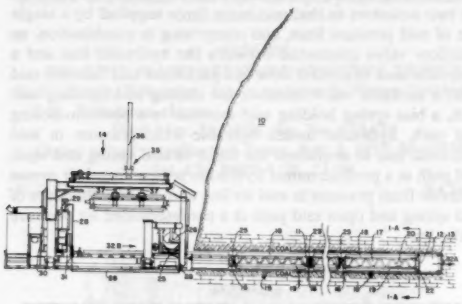
4,036,529
SUPPORT SYSTEM FOR A UNITIZED PAIR OF AUGER CONVEYORS

Arthur L. Hawthorne, St. Clairsville, Ohio, and David R. Hazen, McMurray, Pa., assignors to Continental Oil Company, Ponca City, Okla.

Filed May 2, 1975, Ser. No. 574,135
Int. Cl.[2] E21C 27/22
U.S. Cl. 299—19 5 Claims

1. In an auger mining system which forms an opening comprising a pair of axially aligned cylindrical holes in the earth, said opening having a bottom, said system having a pair of

side-by-side auger conveyors, each auger having a shaft and a flight around said shaft, which shafts are journaled through bearings at each end to a spacing member and wherein said spacing members are rigidly tied to each other by a longitudi-



nal member having an underside and a supporting apparatus comprising an elongated skid means attached to the underside of said longitudinal member of said suger pair and extending to the bottom of said opening.

4,036,530

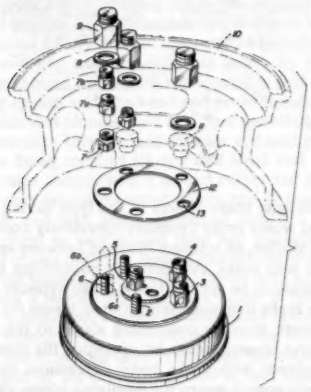
WHEEL ADAPTOR DEVICE

Merlyn R. Reppert, Torrance, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 521,026, Nov. 5, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,352

Int. Cl.[2] B60B *3/16*

U.S. Cl. 301—9 DN **8 Claims**



1. In combination, a vehicle wheel having a circle of round mounting holes therein, a set of adaptor bolts for mounting said vehicle wheel onto a circle of vehicle wheel mounting studs, wherein said mounting holes, said bolts, and said studs are all equal in number but said mounting holes and said studs may be located on different diameter circles, each said adaptor bolt comprising an internally threaded bore for cooperation with a mounting stud, said bolt being small enough to fit entirely through a wheel mounting hole, said bolt having external threads adapted to mate with means to hold said wheel on said studs, and said internally threaded bore being eccentrically located in said adaptor bolt with respect to said external threads, whereby said adaptor bolts can mount a wheel formed with one diameter circle of openings onto any one of a plurality of different circle diameters of wheel mounting studs.

4,036,531

VALVE FOR A PULSE-WAVE PNEUMATIC CONVEYANCE INSTALLATION

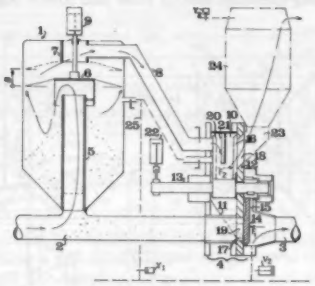
Otto Rusterholz, Via G.A. Borgese 14, Milan, Italy

Filed May 10, 1976, Ser. No. 684,779

Claims priority, application Italy, May 16, 1975, 23390/75

Int. Cl.[2] B65G *53/58*

U.S. Cl. 302—26 **9 Claims**



1. A valve device particularly adapted for cyclically cutting off the flow of a carried fluid (air) and of a solid incoherent material in a pneumatic conveyance installation in which the advance of said fluid and said material takes place by the agency of cyclical pulse waves, said valve device comprising a housing and valve elements; said housing including a body, first and second end plates, and a discharge conduit; said end plates and said body in combination defining a valve chamber, said valve elements including a shaft rotatably journalled in said housing and passing through at least said valve chamber and said second end plate, first and second entrance passages through said first end plate into said valve chamber, a first vane carried by said shaft for rotation therewith and cooperation with said first end plate selectively separately to close said entrance passages, a vent passage from said valve chamber through said second end plate, a second vane carried by said shaft for rotation therewith and for cooperation with said second end plate for closing said vent passage at a time when said first vane has closed said second entrance passage, a discharge passage through said second end plate from said valve chamber remote from said vent passage, a supply passage through said second end plate adjacent said discharge passage and independent of said valve chamber, said discharge passage and said supply passage opening into said discharge conduit, and a third vane carried by said shaft for rotation therewith and for cooperation with said second end plate for closing said discharge passage and said supply passage when said first entrance passage is closed and said second entrance passage and said vent passage are open, the relationship of said vanes and said passages being one wherein when said shaft is rotated to open said first entrance passage said vent passage and said second entrance passage are closed and said discharge passage and said supply passage are open.

4,036,532

FLUIDIZING OUTLET

Jerry D. Waddell, O'Fallon, and John J. Scheeter, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 616,508, Sept. 24, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,030

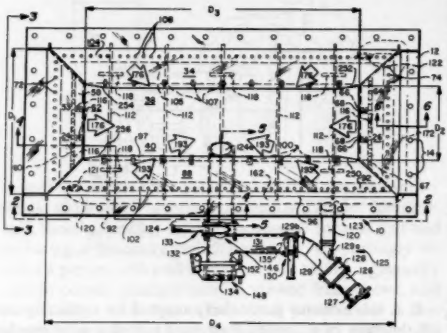
Int. Cl.[2] B65G *53/36*

U.S. Cl. 302—53 **16 Claims**

1. A fluidizing outlet comprising:

a bottom pan inclined downwardly from an upper mounting flange for mounting on a hopper; at least one plenum sheet extending from said mounting flange downwardly; said

plenum sheet and said bottom pan defining therebetween a plenum chamber; at least a portion of said plenum sheet at the lower edge thereof being spaced from the bottom pan within the range of about 0.03 to about 0.04 inches to define first fluidizing openings; said first fluidizing openings being sufficient to effect fluidization of particulate lading, being sufficient that the openings are not readily clogged during operation, and being sufficient to obtain substantially complete removal of the lading during unloading; said plenum sheet having a plurality of second fluidizing openings spaced from said lower edge of said



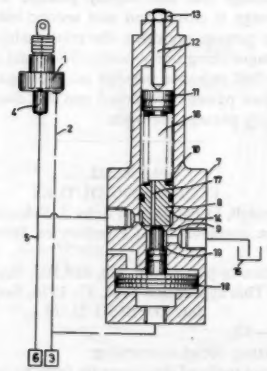
plenum sheet in communication with said plenum chamber and extending through said plenum sheet and being spaced from each other within the range of about 0.75 to about 1.25 inches and of a size within the range of from about 0.002 to about 0.004 in.^{2} and sufficient to effect fluidization of particulate lading, sufficient that the openings are not readily clogged during operation, and sufficient to obtain substantially complete removal of the lading during unloading; and means for supplying fluidizing air to said plenum chamber whereby said fluidizing air may pass through said first and second fluidizing openings to fluidize the lading.

4,036,533

FORCE LIMITING DEVICE FOR A PARKING BRAKE ACTUATOR ARRANGED IN SERIES WITH A SERVICE BRAKE ACTUATOR

Uno Ingemar Kraft, Malmö, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Nov. 30, 1976, Ser. No. 746,116
Claims priority, application Sweden, Dec. 5, 1975, 7513714
Int. Cl.^{2} B60T *15/02*; F16D *65/14*
U.S. Cl. 303—6 A **7 Claims**



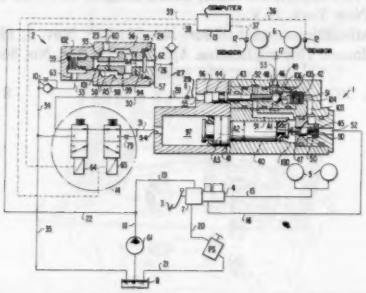
1. A force limiting device connected with the hydraulic and air pressure lines in a braking system having the hydraulic pressure line coupled to control a parking brake actuator and the air pressure line connected to control a service brake actuator wherein said brake actuators are connected in series, said force limiting device operable to limit the maximum force on the two actuators to that maximum force supplied by a single one of said pressure lines, and comprising in combination, an overflow valve connected between the hydraulic line and a hydraulic tank to control flow in a path from said line into said tank, a movable valve member for closing and opening said path, a bias spring holding said member in a position closing said path, hydraulic means operable from pressure in said hydraulic line to overcome the force of said spring and open said path at a predetermined hydraulic pressure, and air means operable from pressure in said air line to overcome the force of said spring and open said path at a predetermined air pressure in the line.

4,036,534

ANTI-SKID CONTROL APPARATUS WITH BOOSTER DEVICE AND PRESSURE REDUCING DEVICE

Toshiyuki Kondo, Anjo, and Takashi Nagashima, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed July 7, 1976, Ser. No. 703,149
Claims priority, application Japan, July 7, 1975, 50-83340; July 7, 1975, 50-83341; July 7, 1975, 50-83342
Int. Cl.^{2} B60T *8/02*
U.S. Cl. 303—6 R **4 Claims**



1. In a hydraulic brake system of the type having a master cylinder, rear wheel brake cylinders operatively connected to said master cylinder, an actuator disposed between said master cylinder and said brake cylinders for controlling the brake pressure increase to be applied to the brake cylinder in accordance with a brake lock condition, control means for applying a brake pressure increase controlling signal to the actuator, hydraulic brake booster means for operating the master cylinder in accordance with brake pedal depression, and a fluid pressure power source means for supplying power pressure to said booster means wherein the actuating pressure of the hydraulic brake booster means is utilized as the actuating pressure for the actuator, the improvement comprising regulating means interposed between said booster means and said actuator, said regulating means including a valve for decreasing the output pressure of the regulating means when the pressure of said booster means being applied to said regulating means rises above a predetermined value, piston means in said actuator responsive to the output pressure of said regulating means and valve means in said actuator under the control of said piston means for controlling communication between said master cylinder and said brake cylinders, said piston means being adapted to open said valve means to permit communication between said master cylinder and said brake cylinders when the output pressure of said regulating means is below a predetermined value thereby increasing the output pressure of the

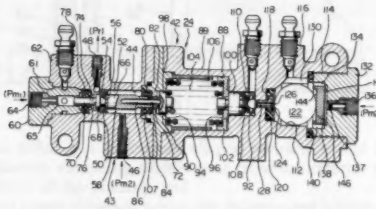
actuator at the same ratio as the input pressure thereto and also being adapted to repeat on-off movement of said valve means when the output pressure of said regulating means is more than said predetermined value to increase the output pressure of the actuator at a smaller ratio than the input pressure thereto.

4,036,535

BRAKING FLUID PRESSURE CONTROL DEVICE

Sadao Katoh, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 31, 1976, Ser. No. 672,174
Claims priority, application Japan, Apr. 1, 1975, 50-42839[U]
Int. Cl.[2] B60T 8/26, 13/06
U.S. Cl. 303—6 C **9 Claims**



1. A fluid pressure control device for a motor vehicle hydraulic braking system, comprising a housing formed therein with a first cavity having outer and inner opposite end walls, each of said end walls being formed with an aperture, a plunger axially movably extending through said first cavity and slidably fitted in said apertures, said plunger having a first series of positions in which an input fluid pressure is less than a critical fluid pressure and an output fluid pressure is equal to said input fluid pressure, and a second series of positions in which said input fluid pressure is greater than said critical fluid pressure and said output fluid pressure is less than said input fluid pressure, said plunger being formed with a first bore which extends inwardly and axially from an inner end of said plunger and has a blind end and an open end, said first bore being tapered toward said blind end, a push rod located in said first bore and engaging against said blind end and projecting from said open end outside said plunger, said first bore providing at said open end a clearance between said plunger and said push rod, said clearance being reduced toward said blind end, said housing being formed therein with a second cavity and a second bore which opens into said second cavity and is located between said inner end wall and said second cavity, a plunger seat slidably fitted in said second bore and engaging against an inner end of said push rod, biasing means located in said second cavity, said housing being formed therein with a fluid chamber into which a second fluid pressure equal to said input fluid pressure is delivered, a piston slidably fitted in said fluid chamber, said biasing means being located between said plunger seat and said piston to urge same in opposite directions, said piston being urged by the pressure of fluid in said fluid chamber to urge said biasing means, and a control valve operable in response to a predetermined deceleration rate to close an inlet of said second fluid pressure to said fluid chamber to maintain the pressure of fluid in said fluid chamber at a predetermined value.

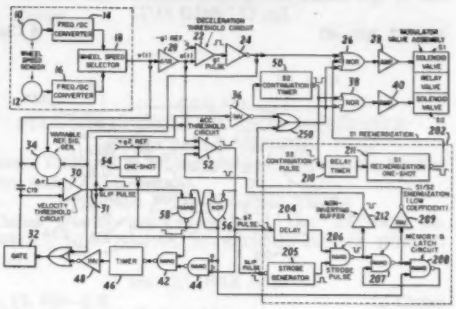
4,036,536

WHEEL SLIP CONTROL SYSTEM ADAPTED TO USE ON LOW COEFFICIENT SURFACES

Donald S. Quon, St. Louis County, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed July 15, 1976, Ser. No. 705,662
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—96 **6 Claims**

1. In a vehicle having at least one monitored wheel and a wheel slip control system of the type wherein at least a wheel deceleration signal is used to trigger the energization of at least one level of brake relief and at least a wheel acceleration signal is used to trigger termination of energization of at least one level of brake relief, the improvement comprising:



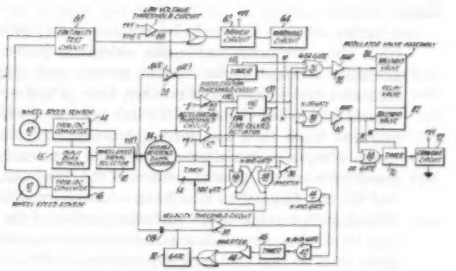
a. means for re-energizing said at least one level of brake relief for a first fixed predetermined period of time; and
b. means for delaying the operation of said re-energizing means for a second fixed predetermined period of time after the termination of said energization.

4,036,537

TIME DELAYED ACTUATION OF WHEEL SLIP CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

Joseph E. Fleagle, Overland, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Oct. 6, 1975, Ser. No. 620,164
Int. Cl.[2] B60T 8/02, 8/08
U.S. Cl. 303—106 **8 Claims**



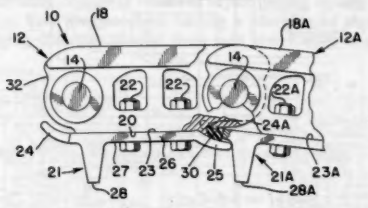
1. In combination with a wheel slip control system for automotive vehicles and the like wherein deceleration signals and deceleration plus velocity change signals are separately processed to provide two or more levels of brake relief, the invention comprising:
a. means for blocking at least a first level of brake relief;
b. means for removing the block from said first level of brake relief;
c. said means for removing being actuated by the trailing edge of a signal indicating the first simultaneous occurrence of a predetermined combination of wheel velocity and wheel deceleration conditions; and
d. said means for removing containing means for remaining continuously actuated as long as the time between the trailing edges of the signals indicating succeeding simultaneous occurrences of said predetermined combination of wheel velocity and wheel deceleration conditions remains below a predetermined value.

4,036,538

TRACK SHOE BACK-BEND BUMPER

Glen M. Haslett, Peoria, and Roger L. Boggs, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1975, Ser. No. 634,950
Int. Cl.² B62D 55/22
U.S. Cl. 305—47 6 Claims



1. In an endless track assembly including a plurality of links, each link having a pair of upstanding link elements; hinge means for separating each pair of upstanding link elements and interconnecting each pair of link element to an adjacent pair of link elements to allow flexure of said endless track in first and second directions; and a plurality of track shoes having a link side and a grouser side, each shoe removably affixed on the link side to a matching link, each track shoe defining an overlap portion at one end and an underlap portion at the opposite end, the overlap portion of one track shoe in overlapping relation with the underlap portion of the adjacent track shoe, said track shoes further having a grouser portion on the grouser side extending outwardly therefrom and adjacent to said underlap portion, with flexure in the first direction limited by the overlap portion of the one shoe engaging the grouser portion of the adjacent shoe, the improvement comprising resilient means associated with said overlap portion for lessening impact shock between said overlap portion of the one shoe and said grouser portion of the adjacent shoe during flexure in the first direction;

and further wherein said underlap portion of each adjacent track shoe comprises outwardly extending projections generally at right angles to said grouser and spatially separated to define a pair of notches, each of said notches aligned with a link element of the link associated with the said one track shoe and further wherein said resilient means comprises an elastomeric member removably disposed between the overlap portion of the one track shoe and the link element to which the said one track shoe is affixed, with a notch on the underlap portion of the adjacent track shoe surrounding said elastomeric member on three sides so that said underlap portion of the adjacent track shoe contacts and compresses said elastomeric shape during flexure in the first direction before said overlap portion of the one track shoe contacts the grouser portion of the said adjacent track shoe.

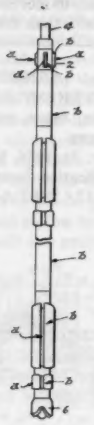
4,036,539

DRILL STRING SYSTEM

Leonard R. Saunders, 2522 Watts Road, Houston, Tex. 77025, and G. D. Skip Allard, 14602 Dale Hollow Lane, Cypress, Tex. 77429

Filed May 9, 1975, Ser. No. 576,030
Int. Cl.² F16C 1/26
U.S. Cl. 308—4 A 11 Claims

1. In a drill string, including a metallic tubular body having wear-resistant bearing surfaces extending outwardly from said body, the improvement in combination with said drill string, comprising a coating of hard, slick adherent plastic on the



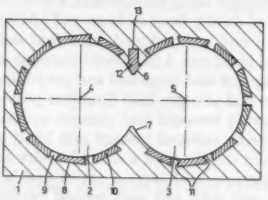
non-bearing surfaces of said string, to reduce material build-up between the non-bearing surfaces during drilling.

4,036,540

SCREW EXTRUDER HOUSING

Wilhelm Seufert, Korntal, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed May 19, 1975, Ser. No. 579,008
Claims priority, application Germany, June 1, 1974, 2426732
Int. Cl.² F16C 33/00
U.S. Cl. 308—239 8 Claims



1. In a screw extruder housing for a screw extruder machine, which housing has one or more axially parallel bores for a screw shaft, the wall of each bore being provided with a wear-resistant lining, the improvement wherein:

the wall of each bore is provided over its entire periphery with a plurality of recesses which are bounded by lands formed between adjacent recesses; and

each of said recesses has a wearing insert disposed therein, said insert being made of a non-metallic material more wear resistant than the wall and being produced by the process of introducing the insert material into said recesses in the wall in a formable condition, and forming and hardening the inserts in situ.

4,036,541

LOCKING ARRANGEMENT FOR CABINETS

Seymour M. Kantor, 9 Errol Place, New Rochelle, N.Y. 10809

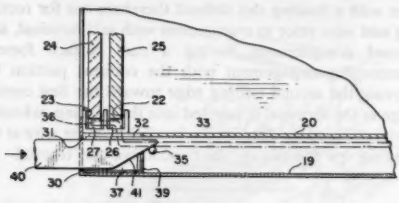
Filed June 24, 1976, Ser. No. 699,818
Int. Cl.² E05B 65/46; E05D 13/04
U.S. Cl. 312—138 R 26 Claims

21. Pilferage protection display cabinet arrangement which comprises

a housing having an access aperture,

sliding panel means movable along a predetermined sliding path for closing and opening the access aperture and having contact surface means concealed from the exterior of the housing,

an obstruction element disposed within the housing and concealed from the exterior thereof, and mounted for movement into and out of blocking position and normally resiliently biased toward such blocking position for blocking contact with the contact surface means of the sliding panel means to prevent the opening thereof when such sliding panel means is moved to close the access opening,



means defining a selectively shaped restrictive tool insert guideway extending along a path from the exterior to the interior of the housing, and

control means disposed within the housing and hidden from the exterior thereof, and situated crosswise of the path of the guideway and operatively connected to the obstruction element for effecting the movement of the obstruction element out of the normally biased blocking position upon exterior insertion of a corresponding selectively shaped cooperating tool into the guideway and along such path and into coactive motion transmission contact with such control means.

4,036,542

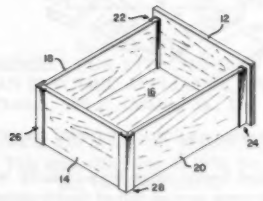
KNOCK-DOWN DRAWER CONSTRUCTION

Robert M. Courtwright, Tacoma, Wash., assignor to Hauserman, Inc., Tacoma, Wash.

Filed Dec. 8, 1975, Ser. No. 638,537

Int. Cl.[2] A47B *47/00, 43/00*

U.S. Cl. 312—330 R **7 Claims**



1. A knock-down drawer construction comprising:

a drawer front;

a pair of resilient front clamps, generally U-shaped in cross section, each clamp having a center leg, an inner leg, and an outer leg, said clamps being fastened to the rear face of said drawer front at spaced apart points thereof by threaded fasteners each of which extend through said center legs and engage said drawer front, said fasteners having a head projecting rearwardly beyond the rear face of said center leg, said clamps further including inwardly extending tabs along the vertical edges of said outer legs;

a pair of drawer sides, each side having its forward end received by one of said front clamps with the tabs of each clamp inserted in a vertical groove on the outer face of the respective drawer side, the inner faces of said drawer sides containing a longitudinal slot adjacent the lower edges thereof which extend the full length of said side, the forward edges of said sides having recesses formed therein adjacent the rearwardly projecting heads of said fasteners, said recesses being of sufficient depth to accommodate the projecting portion of said fasteners such that said clamps receive said drawer sides with the major portion of the forward edges thereof abutting the center legs of said clamps.

4,036,543

PLUG RECEPTACLE HAVING A ROTATABLE RECEPTACLE MEMBER

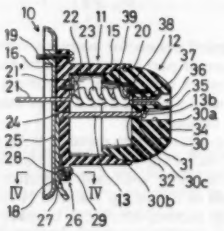
Bunsaku Taketomi, 56-141 aza-Ishikane, oaza-Iwasaki, Nisshincho, Aichi, Aichi, Japan

Filed Oct. 27, 1976, Ser. No. 735,914

Claims priority, application Japan, Oct. 27, 1975, 50-146691[U]; Nov. 29, 1975, 50-162554[U]; July 12, 1976, 51-92616[U]

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—2 R **12 Claims**



1. A plug receptacle comprising:

a socket member adapted for connection with an outlet in a wall of a room or the like and having an open end;

a ball member bearing on said open end of said socket member;

means for connecting said ball member to said socket member to hold said ball member in bearing relation to said socket member;

said socket member comprising:

a sleeve having one end formed with a flared bearing surface encircling said open end of said socket member, said sleeve having an internal radius defining a minimum radius of said bearing surface;

an insulating base provided at another end of said sleeve;

means provided on said insulating base for fastening said socket member to said wall outlet; and

contact blades projecting from said insulating base and adapted for insertion into said wall outlet;

said ball member comprising:

a body including a generally flat front surface; a concavely shaped rear surface generally facing said insulating base; and a spherically shaped outer peripheral surface extending between said front and rear surfaces and having a radius which is greater than said minimum radius of said bearing surface of said sleeve;

openings formed through said body and open at said front surface;

connectors provided on said rear surface and connected to said contact blades by conductors; and

female receptacles each placed in one of said openings and connected to one of said connectors;

said connecting means having one end releasably fastened to said insulating base and another end flexibly connected to said rear surface of said ball member body, whereby said outer peripheral surface of said ball member is slidably held in contact with said bearing surface of said socket member.

4,036,544

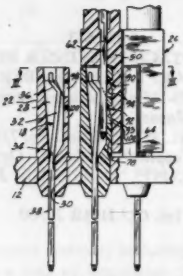
CONTACT FOR MULTIPLE CONDUCTOR CONNECTOR

Josef Keglewitsch, Addison, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 515,225, Oct. 16, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,197

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—91 R **5 Claims**



1. An electrical connector assembly comprising:

a first connector part including a first electrical contact and a first contact support for supporting said first electrical contact with a protective wall of insulating material for said first contact; and

a second connector part matable with said first connector part and including a projecting second electrical contact which is matable with said first electrical contact, and a guide wall of insulating material having a portion spaced from said second electrical contact for receiving said protective wall therebetween, said second electrical contact fitting between a portion of said first electrical contact and protective wall,

said guide wall including a projecting portion biased by said second electrical contact into an interference relationship with said protective wall, and

said protective wall including a receiving portion which receives said projecting portion in response to a predetermined mated positioning of said contacts.

4,036,545

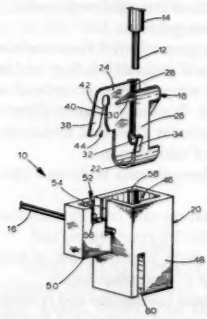
CONNECTOR ASSEMBLY

Eugene J. Mysiak, Cicero, and Allen J. Bury, Prospect Heights, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed May 6, 1976, Ser. No. 683,963

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—95 D **3 Claims**



3. A connector assembly comprising:

an insulation displacement terminal including a relatively rigid portion with a first insulation cutting edge formed thereon and a resilient portion spaced from said rigid portion having a second insulation cutting edge formed thereon facing and movable toward the first cutting edge, the space between said first and second cutting edges defines an insulation displacement slot for receiving a wire and being spaced a distance not less than the diameter of the conductive part of the wire; and

a housing with an opening through which said terminal is receivable, said housing including a first compartment for receiving the rigid portion of the terminal and said wire and a second compartment spaced from the first compartment for receiving the resilient portion of the terminal, said compartments having means allowing communication with a loading slot defined therebetween for receiving said wire prior to engagement with said terminal, said second compartment having a cam surface formed thereon for engagement with the resilient portion for moving the second cutting edge toward the first cutting edge as the terminal is inserted into the housing, whereby said cutting edges displace the insulation of the wire at the loading slot and engage the conductive part thereof.

4,036,546

PARTS COMPRISING A METAL STRAP, U-SHAPED METAL CLIP, AND ADJUSTABLE CLAMPING MEANS, FOR MAKING AN ELECTRICAL TERMINAL ASSEMBLY

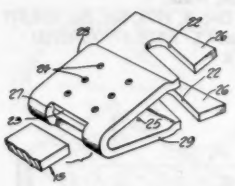
John T. Thompson, 244 Loring St., Los Angeles, Calif. 90024, and George W. Gillemot, 2331 20th St., Santa Monica, Calif. 90405

Continuation of Ser. No. 419,135, Nov. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 286,078, Sept. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 107,949, Jan. 20, 1971, abandoned. This application Mar. 27, 1975, Ser. No. 562,436

The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.

Int. Cl.[2] H01R *3/02, 7/08*

U.S. Cl. 339—95 R **4 Claims**



1. Parts for making a solderless terminal assembly, comprising:

a. an elongated heavy-gauge high-capacity wide strap of rectangular cross section and of ductile metal;

b. a long U-shaped clip of metal formed from heavy gauge strip stock of substantially greater width than said strap, said clip having a rectangular opening extending transversely of the bight portion thereof sized to receive one end of said strap inserted endwise therethrough, and said clip having a pair of aligned openings through the free ends of its legs, the legs of said clip having strap gripping areas which are provided with protrusions projecting from the inner surfaces of said clip legs, said protrusions being adapted to penetrate into opposite surfaces of the strap when said legs are clamped thereagainst; and

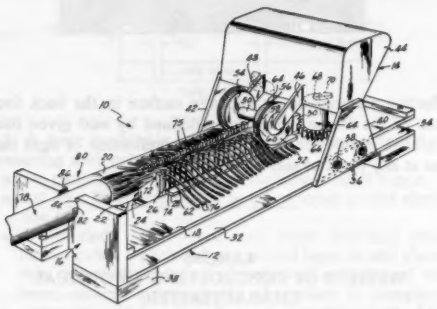
c. adjustable clamping means mountable in said aligned openings for clamping and anchoring one end of said strap immovably between said gripping areas of said clip legs, when inserted therebetween, to provide a high capacity electrical and strong mechanical connection therebetween as said clamping means is tightened.

4,036,547

ELECTRICAL CONNECTOR HAVING AN ELONGATE REAR SLOT COMMUNICATING WITH CONDUCTOR RECEIVING CHANNELS VIA CONDUCTOR RECEIVING AND HOLDING NOTCHES

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 527,998, Nov. 29, 1974, abandoned, which is a division of Ser. No. 402,132, Oct. 1, 1973, Pat. No. 3,866,293. This application July 27, 1976, Ser. No. 708,930
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—99 R 3 Claims



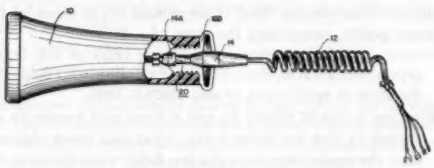
1. An electrical connector comprising:
a contact support including a rear end element;
means defining a plurality of channels in said end element, each of said channels opening laterally outwardly of said end element;
a plurality of insulation-piercing contact portions disposed in said channels and supported by said contact support;
a ridge extending rearwardly from said end element and transversely across said channels; and
notch means defining a plurality of rearwardly open notches in said ridge, each of said notches contiguously opening into and communicating with a respective channel to receive and hold a respective conductor.

4,036,548

GRIP ASSEMBLY FOR ATTACHING AN ELECTRIC CORD TO AN ELECTRIC APPLIANCE, AND THE LIKE

Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004

Continuation-in-part of Ser. No. 613,080, Sept. 9, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,184
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 C 7 Claims



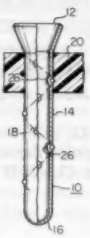
1. A grip assembly for use with an electrical appliance, and the like, for attaching an electric cord to the appliance, said grip assembly including: a sleeve affixed to the end of the cord and having an external peripheral shoulder formed thereon; and a plurality of arcuate-shaped members positioned adjacent to one another to surround said sleeve and having external threads thereon to enable the arcuate-shaped members to be threaded into the appliance to form a split bushing surrounding the sleeve for receiving the sleeve and having an inner bore surface engaging the periphery shoulder thereon.

4,036,549

WIRE CONNECTOR

Takeo Honda, and Hisatomo Matsushima, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Continuation of Ser. No. 500,551, Aug. 26, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,833
Claims priority, application Japan, Aug. 27, 1973, 48-96015; Nov. 20, 1973, 48-133936[U]; Nov. 30, 1973, 48-138435[U]
Int. Cl.[2] H01R *9/06*
U.S. Cl. 339—275 R 3 Claims



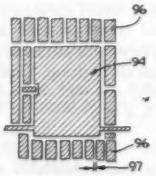
1. An electrical connector comprising: a hollow elongated conductive sleeve portion having a conductor-receiving bore having a generally cross section for receiving, in use, an elongated conductor insertable therein; said sleeve portion having at least one row of spaced rigid projections projecting inwardly of said bore and disposed axially and perimetrically of said bore along a generally helical path; and said projections having an inward extent a into said bore satisfying the relationship $D - 2a < d < D - a$ wherein D is a transverse dimension of the bore and d is a transverse dimension of the elongated conductor so that the elongated conductor contacts the projections when inserted into the bore and assumes a generally helical shape, thereby to impart resistance to removal of the elongated conductor from said bore.

4,036,550

LIQUID CRYSTAL DISPLAY

James Shou-Chen Yih, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 388,832, Aug. 16, 1973, abandoned. This application July 28, 1975, Ser. No. 599,593
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—160 LC 8 Claims



1. In a liquid crystal display which includes a first and second substrate disposed in a substantially parallel configuration and having a liquid crystal material disposed therebetween, said second substrate having conductive transparent indicia members thereon and a plurality of electrical leads selectively coupled to said indicia members, an improvement comprising:
a substantially reflective and conductive surface on said first substrate in underlying relationship to said indicia members, said reflective and conductive surface covering a

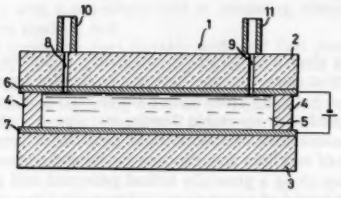
substantial part of said first substrate and said surface on said first substrate being configured and arranged into a plurality of non-energized areas without direct electrical connection thereto, energized areas having electrical connections thereto, and a nonconductive and nonreflective isolation area between each of said non-energized areas and each of said energized areas, at least one of said non-energized areas being aligned with respect to each of said electrical leads so as to completely underlie said one electrical lead, one of said energized areas being aligned with respect to at least one of said indicia members so as to underlie said one indicia member, each of said electrical leads overlies said isolation area and at least one of said non-energized areas to display said indicia members without displaying said electrical leads and said isolation area.

4,036,551

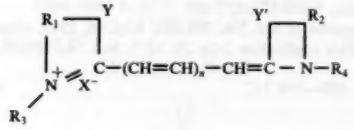
DISPLAY APPARATUS

Hiroshi Mori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 668,974
Claims priority, application Japan, Mar. 22, 1975, 50-34697
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 R **11 Claims**



1. A display apparatus comprising:
a. a first transparent electrode;
b. a second electrode arranged opposite to said first transparent electrode; and
c. an electric-responsive layer containing cyanine dye, interposed between said first transparent electrode and said second electrode, said cyanine dye being represented by the following general formula:



where R_1 and R_2 represent aromatic group or —CH=CH—, R_3 and R_4 represent alkyl group, Y and Y′ represent —CH=C-H—, —O—, —S—, —Se— or $=C=(CH_3)_2$, X represents I, Br or Cl, and $n=0$, 1, 2 or 3.

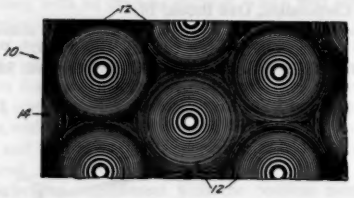
4,036,552

RETROREFLECTIVE MATERIAL MADE BY RECORDING A PLURALITY OF LIGHT INTERFERENCE FRINGE PATTERNS

Pui Kum Lee, White Bear Lake, and Wolfgang H. Strehlow, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 10, 1975, Ser. No. 548,439
Int. Cl.² G02B 5/12
U.S. Cl. 350—97 **1 Claim**

1. A retroreflective material comprising a transparent medium having at one surface thereof a plurality of diffraction elements defining an array of fresnel zone plates each of which diffraction elements represent a light interference fringe pattern, said medium having a thickness equal to a given focal length associated with the fresnel zone plates and having a



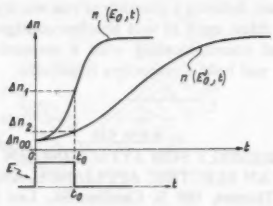
reflective material on an opposite surface in the back focal plane of the fresnel zone plates defined by said given focal length, to enable the continuous retroreflection of light incident at any point of said one surface.

4,036,553

METHOD OF CONTROLLING AN OPTICAL CHARACTERISTIC

Joseph Borel, Echirolles; Jean-Claude Deutsch, Grenoble; Guy Labrunie, Seyssinet, and Jacques Robert, St-Egreve, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 392,324, Aug. 28, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,987
Claims priority, application France, Aug. 29, 1972, 72.30685; July 17, 1973, 73.26109
Int. Cl.² G02F 1/16
U.S. Cl. 350—160 LC **2 Claims**



1. A method of controlling the optical index of the points of a liquid crystal layer to a desired value n_0, said layer comprising a plurality of points, with an electric field, the application of an electric field of amplitude E_0 at a point causing the appearance of an electric field of amplitude E'_0 at some of the adjacent points, comprising the steps of:

determining the transitory response n (E,t) of the liquid crystal index n at an electric field of amplitude E, t being the duration of application of said electric field,

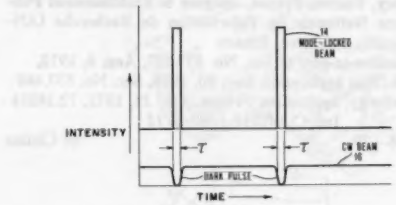
selecting a pair of values E_0 and t_0 from said transitory response so that the index n (E_0, t_0) at said point obtained after the application of an electric field of amplitude E_0 for a duration t_0 is equal to a desired value n_0, and so that the index n (E'_0, t_0) at said adjacent points obtained under the influence of the electric field of amplitude E'_0 for said duration t_0 differs only slightly from the index value before the electric field is applied and applying to said liquid crystal at said points, said electrical field of amplitude E_0 for a duration t_0, to obtained said desired value n_0 at said points and to maintain unchanged the optical index at said adjacent points.

4,036,554

LASER MODULATOR FOR PRODUCING DARK-PULSES

Robert James Bennett, Carmel, and Daniel Richard Grischkowsky, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,747
Int. Cl.[2] H01S *3/00*
U.S. Cl. 350—160 R 10 Claims



1. A laser modulator for generating a laser output beam containing dark pulses comprising:

a two-photon absorption cell containing a metal vapor,

a first laser beam introduced as a first input to said absorption cell,

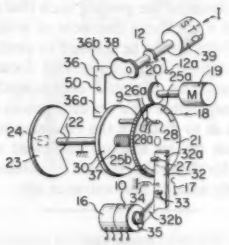
and a second, mode-locked laser beam including mode-locked pulses introduced as a second input to said absorption cell, said mode-locked pulses of said second laser beam causing a two-photon absorption to completely extinguish said first laser beam during the period of said mode-locked pulses to produce an output laser beam from said absorption cell having dark pulses occurring in synchronism with said mode locked pulses.

4,036,555

ELECTROMAGNETIC TRIGGER DEVICE IN MOTOR-DRIVEN CAMERA CAPABLE OF TIME EXPOSURE

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 11, 1975, Ser. No. 557,388
Claims priority, application Japan, Mar. 19, 1974, 49-30548
Int. Cl.[2] G03B *21/38*
U.S. Cl. 352—169 15 Claims



1. An electromagnetic trigger device in a motor-driven camera comprising:

1. a power source;
2. a motor;
3. trigger switch means;
4. shutter driving means driven by said motor for driving a shutter and movable between a closed shutter position in which the shutter is completely closed and an open shutter position in which the shutter is fully open;
5. latching means movable between a latching position and a non-latching position, said latching means being adapted, when moved to said latching position, to latch said shutter driving means which occupies one of the closed and open shutter positions;
6. a motor switch for electrically connecting said motor to said power source when said latching means is in the non-latching position;
7. starting electromagnetic means energized to attract said latching means to move it to the non-latching position for a predetermined time interval when said trigger switch means is operated, sid predetermined time interval being shorter than the shorter of the time required for said shutter driving means to move from the closed shutter position to the open shutter position and the time required for said shutter driving means to move from the open shutter position to the closed shutter position;
8. a selector member for selecting continuous exposure mode and time exposure mode;
9. holding electromagnetic means responsive to said selector member and said triger switch means, said holding electromagnetic means being energized to hold said latching means in the non-latching position when said selector member selects the continuous exposure mode and when said trigger switch means is being operated; and
10. preventing means responsive to said selector member, said preventing means preventing said latching means from latching said shuttr driving means which occupies the open shutter position when said selector member selects the continuous exposure mode,

said lathcing means including rotary means rotating in unison with said shutter driving means and movable means attracted by said starting electromagnetic means to be moved from the latching position to the non-latching position,

said movable means being, when it is in the latching position, engaged with said rotary means to latch said shutter driving means occupying one of the closed shutter position and the open shutter position,

said movable means being a single latching lever and said rotary means including first and second members,

said single latching lever being engaged with said first member to latch said shutter driving means in the closed shutter position and with said second member to latch said shutter driving means in the open shutter position,

said preventing means preventing engagement of said latching lever and said second member,

said shutter driving means including a rotary disk,

each of said first and second members comprising a projection extended from a side surface of said disk,

said second member being displaceable with respect to said disk, and

said preventing means including means for displacing the second member to a position in which said latching lever occupying the latching position is not engaged with said second member when said selector member selects the continuous exposure mode.

4,036,556

PRECONDITIONING IMAGE TRANSFER AREAS IN DOCUMENT REPRODUCTION MACHINES

Arthur Holt Knight, and Thomas Travis Underhill, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,755
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 11 Claims

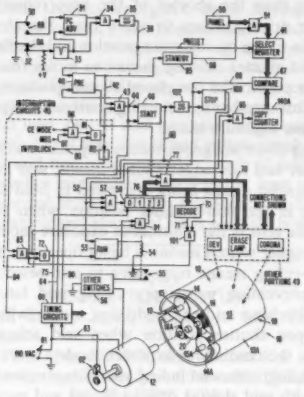
1. A document reproduction machine having means for substituting a new image transfer surface means for a used image transfer surface means, means indicating that said new image transfer surface means is in a predetermined position with respect to said substitute means, said machine being operable in successive machine cycles;

the improvement including, in combination:

means for initiating a preset number of said machine cycles and including means for cycling said machine for said preset number of machine cycles;

means for inhibiting document reproduction during said preset number of machine cycles; and

control means being responsive to said indication of said



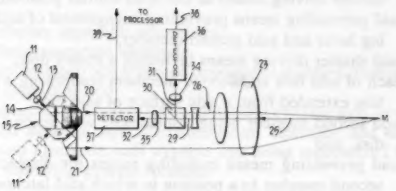
predetermined position to actuate said initiating and inhibiting means.

4,036,557

LASER DOPPLER VELOCIMETER

Craig M. Christensen, Atherton, Calif., assignor to Noctua, Inc., Belmont, Calif.

Filed Oct. 14, 1975, Ser. No. 621,709
Int. Cl.[2] G01P *3/36*
U.S. Cl. 356—28 **25 Claims**



1. A laser doppler velocimeter for measuring the velocity of material at a reference point, said velocimeter comprising:

a pulsed laser source for generating a pulsed coherent radiation input beam having first and second orthogonal polarization components;

first beam splitter means for generating a pair of parallel emergent beams of coherent radiation from said input beam, said parallel emergent beams having different polarization states; said beam splitter means including a first optical axis, a radiation input face to which said input beam is directed, a pair of radiation output faces, said beams emerging from said radiation output faces parallel to said first optical axis, means for generating a first one of said pair of parallel emergent beams as a preselected fractional portion of said first polarization component and for generating the remaining one of said pair of parallel emergent beams as substantially all of said second polarization component and the remaining fractional portion of said first polarization component;

means for focussing said pair of beams to said reference point to produce reflected radiation having a first polarization component containing both doppler differential frequency information and background noise and a second polarization component containing substantially only background noise; and

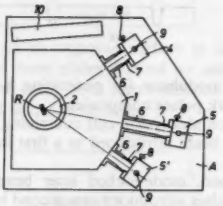
means for separating said reflected radiation into a pair of beams containing said first and second polarization components, respectively, so that the separated reflected beam pair may be directed to a measurement device.

4,036,558

FOCALIZATION PROCESS OF SPHERICAL CONCAVE DIFFRACTION GRATINGS

Michel Pouey, Vanves, France, assignor to Etablissement Public: Agence Nationale de Valorisation de Recherche (ANVAR), Neuilly sur Seine, France

Continuation-in-part of Ser. No. 277,857, Aug. 4, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,460
Claims priority, application France, Apr. 21, 1972, 72.14214
Int. Cl.[2] G01J *3/40, 3/12*
U.S. Cl. 356—79 **16 Claims**



1. In a spectrometric system including a first fixed member defining an entrance slit of finite area, a second fixed member defining an exit slit of finite area, a concave reflective diffraction grating having a selected radius of curvature, the center of said entrance slit presenting an entrance aperture which with the center of said grating defines an optical axis for incident radiation and the center of said exit slit presenting an exit aperture which with the center of said grating defines an optical axis for diffracted radiation, and means for rotating said grating about a fixed axis perpendicular to and passing through the intersection of said optical axes whereby successively to focus different wave lengths of incident radiation at said exit slit, the improvement wherein:

said first member is located a distance r from said center of the grating and said second member is located a distance r' from said center of the grating such that $r > m$ and $r' > n$ where m and n are those distances at which the first and second members would be located to produce a zero sum of the object and image tangential focus for a system having its entrance slit, and consequently its entrance aperture, of negligible area the differences $r - m$ and $r' - n$ being such as to displace the Gaussian reference sphere of the system by an amount sufficient substantially to compensate for those aberrations introduced by said finite, non-negligible area of said entrance slit.

4,036,559

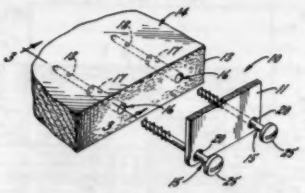
JOINT SECURING AN ARTICLE TO PARTICLE BOARD

Donald G. Whitchurch, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Sept. 11, 1975, Ser. No. 612,317
Int. Cl.[2] F16B *7/18*
U.S. Cl. 403—405 **1 Claim**

1. A joint structure including a piece of composition board having a peripheral edge, a hole formed in and extending inwardly from the edge of said board, an article having an aperture formed therethrough, and a screw extending inwardly through said aperture and into said hole to secure said article to said board, said screw having an elongated shank of substantially uniform diameter and having an enlarged head formed integrally on the outer end of said shank, first and second helical threads formed on the inner portion of said shank with said first thread having a major diameter greater than the major diameter of said second thread and said shank, the outer portion of said shank between said inner portion and

said head being unthreaded, said hole including an outer section having a diameter greater than the major diameter of said first thread and further including a coaxial inner section having a diameter somewhat less than the diameter of said shank, said inner section of said inner section of said hole having a length greater than the length of the inner threaded portion of said



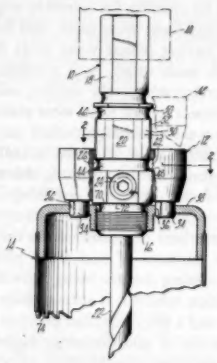
shank and receiving the entire length of said threaded portion and part of the length of said outer unthreaded portion, and said outer section of said hole having a length at least equal to the length of said inner threaded portion of said shank and less than the length of said outer unthreaded portion of said shank and receiving the latter portion with radial clearance.

4,036,560

HEAVY DUTY HOLE SAW AND ARBOR ASSEMBLY

Calvin M. Clark, Bernardston, Mass., and Americo P. D'Attilio, East Hartford, Conn., assignors to Stanadyne, Inc., Hartford, Conn.

Filed Nov. 3, 1975, Ser. No. 628,105
Int. Cl.[2] B23B *41/02*; B27M *3/00*
U.S. Cl. 408—204 **4 Claims**



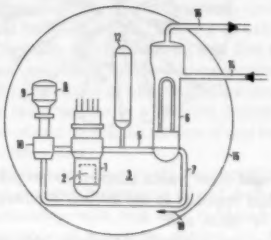
1. For engagement with a power operated chuck, a hole saw and arbor assembly comprising a rotatable chuck engaging arbor including a drive shaft and a threaded section at an end of the drive shaft, a drive collar mounted on the drive shaft for non-rotating axial sliding movement on the drive shaft between a working position and a release position, a hole saw mounted on the threaded section of the arbor for rapid assembly and disassembly of the saw and arbor, a quick-disconnect drive pin fixed to the drive collar, and an opening in the hole saw for receiving the pin when the drive collar is in working position on the drive shaft to transmit torque between the drive collar and saw during rotation of the arbor, the drive collar in said working position being in confronting face to face relation to the saw, the drive collar in release position being in retracted relation to the saw and remotely spaced from the saw a distance sufficient to withdraw the drive pin from the saw opening without disengaging the arbor and chuck while permitting quick and easy assembly and disassembly of the saw and the threaded section of the arbor.

4,036,561

PRIMARY COOLANT PUMP FOR NUCLEAR REACTORS

Elmar Harand, Hochstadt; Gerd Richter, Nurnberg, and Günter Tschöpel, Erlangen, Tennenlohe, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Aug. 28, 1974, Ser. No. 501,337
Claims priority, application Germany, Sept. 6, 1973, 2345081
Int. Cl.[2] B27C *9/00*; G21C *9/00*
U.S. Cl. 415—18 **2 Claims**



1. A pressurized-water reactor main coolant pump comprising a pump housing having an inlet passage and an outlet passage through which passages the housing is connected in a cold leg of a pressurized water reactor pressure-vessel main cooling loop containing pressurized-water coolant, said housing containing a rotative impeller and the pump having a rotary motor having a normal rotative speed and connected to said impeller to rotate the impeller at said speed to circulate said coolant by a coolant flow normally inwardly through said inlet passage and outwardly through said outlet passage via said housing, a leak in said loop sufficient to cause the pressurized-water coolant discharge through said housing via its said passages at a velocity driving said impeller at a rotative speed greater than said normal rotative speed, causing a reduction in the pressurized-water coolant's pressure at one of said passages relative to the coolant's pressure at the other of said passages, and means automatically responsive to said reduction in pressure for applying a rotative braking force to said impeller; said means comprising at least one non-rotative brake element and a rotative braking surface connected with said impeller to rotate therewith, said brake element being movable from an inoperative position to an operative position where the brake element frictionally engages said surface to brake the impeller against rotation, said brake element having means for normally biasing it to said inoperative position and being movable to said operative position by a piston which is connected to the brake element, said piston being fluid-connected through a valve with a source of fluid pressure for moving the piston so it moves said brake element to its said operative position, said valve being normally closed and having opening means for opening the valve automatically in response to said reduction in pressure.

4,036,562

FOOD DEHYDRATOR AND FAN THEREFOR

Jack H. Barnes, Kellogg Star Rte., Box 100, Oakland, Oreg. 97462

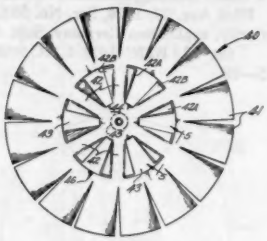
Filed June 30, 1975, Ser. No. 591,617
Int. Cl.[2] F04D *29/32*
U.S. Cl. 415—79 **3 Claims**

1. A circular fan blade formed from a single sheet of lightweight material for moving air in opposite directions past articles being dried in a food dryer, said blade comprising,

an outer series of vanes comprising the peripheral portion of the blade, said vanes having substantially radial leading and trailing edges and being of a pitch to propel an airflow in one direction,

an annular planar blade area inwardly of said vanes,

an inner series of vanes formed from said single sheet of material inwardly of said planar blade area with each inner vane having leading and trailing edge components and being of a pitch opposite to the pitch of each outer



vane, said inner vanes adapted to propel an airflow in a direction opposite to the airflow discharged by the outer series of vanes, and

a central planar hub portion coplanar with said annular blade area and adapted to receive the shaft of a power source.

4,036,563

WAVE MOTOR COMPRISED OF A SUBMERGED FLOATING NETWORK OF CHAMBERS FORMED BY WALLS PERMITTING VARIABLE GEOMETRY

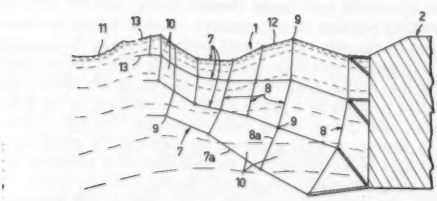
Rolf E. A. Tornkvist, Ritobergsvagen 8-16 L, 00330 Helsingfors 33, Finland

Continuation-in-part of Ser. No. 544,770, Jan. 28, 1975, abandoned. This application June 16, 1976, Ser. No. 696,821

Claims priority, application Finland, Feb. 5, 1974, 312/74; Jan. 9, 1975, 750052/75

Int. Cl.² F04B *17/00*; F03B *13/12*

U.S. Cl. 417—331 **8 Claims**



1. A wave energy transformer for transforming wave energy in a body of water into pressure energy of a pipe system containing water obtained from the body comprising: means forming walls defining a plurality of mutually adjacent floating chambers which are submerged in and in communication with the body of water, said means including a plurality of buoyantly submerged panels pivotally interconnected so that water movement in and around the chambers due to wave action causes the chambers to deform by virtue of relative movement between panels; and pump means having relatively movable parts connected between at least two walls of each chamber, said pump means having an inlet in communication with the body of water and an outlet connected to the pipe system and being operable upon relative movement between its movable parts to draw in water from the body and discharge water to the pipe system.

4,036,564

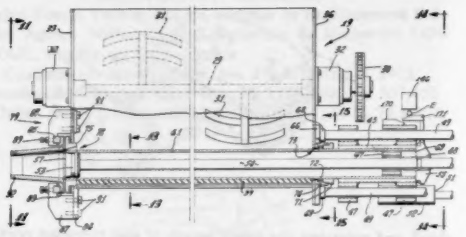
CONCRETE PUMPING APPARATUS

John A. Richards, 1312 Olwyn Drive, Tustin, Calif. 92680

Filed Aug. 2, 1971, Ser. No. 167,959

Int. Cl.² F04B *17/00, 19/02, 15/02*

U.S. Cl. 417—344 **21 Claims**



1. A concrete pumping apparatus, comprising:

a concrete hopper including a discharge end, said hopper having a plurality of longitudinally extending channels defined in its bottom portion to collect plastic concrete supplied to said hopper, said discharge end having a discharge outlet in communication with each of said channels;

slide valve means mounted on said discharge end of said hopper for controlling the discharge of concrete from said discharge outlets, said slide valve means including a fixed wear plate mounted on said hopper discharge end and a movable wear plate, said fixed wear plate having openings aligned with said discharge outlets and said movable wear plate having an opening for selective alignment with said openings in said fixed wear plate, said fixed and movable wear plates having planar wear faces that make sliding contact with each other in a predetermined plane of contact whereby selectively shifting said movable wear plate with respect to said fixed wear plate the discharge of concrete from said discharge outlets may be controlled;

concrete confining sleeves mounted in each of said channels for reciprocating movement along the axes of said channels, each of said concrete confining sleeves having a discharge end that lies in a given plane so that the sleeve discharge ends may be positioned in the plane of contact of the wear surfaces of said wear plates, each of said concrete confining sleeves being movable between a retracted position where it is substantially withdrawn from said hopper and a fully extended position where it communicates with one of said discharge outlets and has its discharge end positioned in the plane of contact of the wear surfaces of said wear plates, said sleeves being operable during their extension through plastic concrete in said hopper to receive and confine concrete therein;

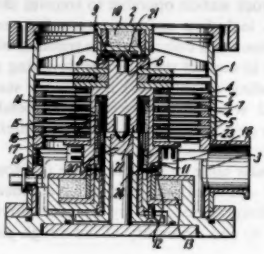
concrete-pumping pistons mounted within each of said sleeves for reciprocating movement therein, each of said pistons including a flat concrete-contacting face and being movable from a retracted position to a fully extended position within its respective sleeve so that said flat piston face is in the plane of its associated sleeve end, whereby said piston and sleeve ends may both be positioned in the plane of contact of the wear faces of said wear plates; and

control means connected to said movable wear plate, to said sleeves and to said pistons for selectively programming the movement of said sleeves and pistons and effecting the shifting of said movable wear plate so that whenever said concrete pumping apparatus is operated plastic concrete within said hopper is received in and pumped out of said sleeves through said slide valve means sequentially through each of said discharge outlets.

4,036,565
PUMP CONSTRUCTION

Willi Becker, Braunfels, Germany, assignor to Balzers Patent und Beteiligungs AG, Liechtenstein

Filed Sept. 22, 1975, Ser. No. 615,342
Claims priority, application Switzerland, Sept. 27, 1974, 13132/74
Int. Cl.[2] F04C 17/00
U.S. Cl. 417—420 8 Claims

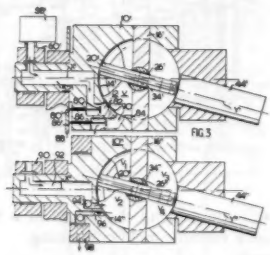


1. A turbo vacuum pump, comprising a cylindrical casing having an intake adjacent one end and an exhaust adjacent an opposite end of said casing, a stator mounted in said cylindrical casing, a rotor arranged within said casing, first rotor mounting means for the radial mounting of said rotor, second rotor mounting means for the axial mounting of said rotor, said second rotor mounting means for the axial mounting comprising an electrodynamic system disposed adjacent said exhaust and including a permanent magnet arrangement which is secured to said rotor and which produces a substantially radial field, and a coil arranged concentrically in respect to said rotor and immersed in said permanent magnet arrangement, said first rotor mounting means comprising at least one permanent magnet arrangement which is fixed to the casing and said rotor has a magnetic portion axially aligned and oppositely facing said permanent magnetic arrangement.

4,036,566
FLUID DISPLACEMENT APPARATUS

Leon A. Konopeskas, London, Canada

Filed May 2, 1975, Ser. No. 573,946
Claims priority, application Canada, May 7, 1974, 199185
Int. Cl.[2] F01C 3/06; F04C 3/00; F01C 1/00; F02B 55/14
U.S. Cl. 418—68 9 Claims



1. A fluid displacement apparatus comprising:

a. a body having a chamber defined therein, at least a portion of the inner surface of such chamber being in the form of a concave spherical segment and having an axis of symmetry,

b. partition means sealingly engaged with said chamber and defining an enclosed space therewith,

c. a baffle defining an imaginary plane extending through said partition means in sealing engagement therewith and movable relative thereto about pivot means defining a first pivot axis lying in the plane defined by said baffle, the orientation of the first pivot axis being fixed relative to said chamber and located in an imaginary plane defined by said partition and perpendicular to and intersecting the axis of symmetry of the chamber,

d. said baffle having a peripheral edge, a portion of which defines an arc of a circle to sealingly engage said inner surface of said chamber in relatively movable relation thereto such that said baffle is capable of oscillating motion relative to said chamber about said first pivot axis whereby to vary the volumes of the regions located between said inner surface and said partition on the opposing sides of said baffle, said baffle defining an axis lying in the plane of the baffle and intersecting said first pivot axis,

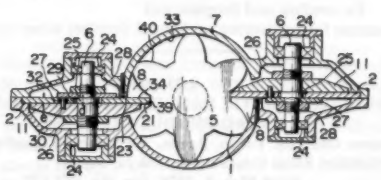
e. port means and valve means communicating with said chamber for permitting or effecting inflow and outflow of fluid from said chamber in a selected fashion during the occurrence of said oscillating motion of said baffle relative to said chamber, and

f. rotatable shaft means operatively connected to said baffle and/or said chamber for rotation of said shaft means about an axis coinciding with said axis defined by the baffle and/or said axis of symmetry defined by the chamber during said oscillating motion of the baffle relative to said chamber whereby the oscillating motion of the baffle relative to the chamber effects rotation of the shaft means or vice versa.

4,036,567
GLOBOID WORM TYPE ROTARY MACHINE

Goro Sato, Atami, Japan, assignor to Hokuetsu Kogyo Co., Ltd., Japan

Filed Apr. 8, 1975, Ser. No. 566,047
Claims priority, application Japan, Apr. 15, 1974, 49-40980
Int. Cl.[2] F01C 1/08, 19/00; F04C 17/04, 27/00
U.S. Cl. 418—105 6 Claims



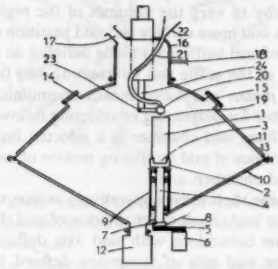
1. A globoid worm type rotary machine comprising a casing, a globoid worm rotor housed in said casing, and pinions extending through apertures in said casing so as to have their teeth extending into the casing and meshing with said globoid worm rotor, a support for said pinion, a rotatable shaft carrying said support, said pinion having a bore receiving said support which bore is larger in diameter than the diameter of the support to permit relative displacement between said pinion and said support in the radial and circumferential directions, and means coupling said pinion to said support and permitting relative displacement between said pinion and said shaft in the circumferential and diametric directions, said means including an elastic member interposed between said support and said pinion for providing resilient displacement of the pinion in its circumferential and diametric directions, whereby said teeth of the pinion can adaptedly engage the threads of said globoid worm rotor.

4,036,568

MACHINES FOR MANUFACTURE OF POWDERS

Jean G. Morlet, Nevers; Yves C. Honnorat, Imphy, and Gerard D. Raisson, Nevers, all of France, assignors to Creusot-Loire, Paris, France

Continuation-in-part of Ser. No. 529,948, Dec. 5, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,278
Claims priority, application France, Dec. 7, 1973, 73.43735
Int. Cl.[2] B22D *23/08*; B29C *23/00*
U.S. Cl. 425—8 **13 Claims**



1. Apparatus for manufacturing metal powder consisting of spherical particles having a diameter between 10 microns and 1000 microns, by spraying molten metal from the end surface of one end of a consumable substantially cylindrical solid metal electrode rotated at high speed about its longitudinal axis, the apparatus comprising:

means for rotating said consumable electrode about said axis and at high speed;

means for locally heating at least one zone of said end surface of said one end of said consumable electrode to fusion point;

means for relatively moving said consumable electrode and said local fusion zone to compensate for consumption of said consumable electrode, whereby when said rotating means is energized and said electrode is rotated at high speed, said fusion zone moves across said end surface of said consumable electrode in a spiral path, metal liquified thereby is expelled centrifugally from said end of said consumable electrode in the form of metal droplets; means for cooling said droplets and

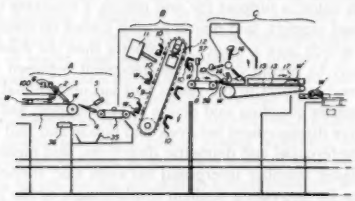
means for recovering said metal droplets when cooled.

4,036,569

FULL-AUTOMATIC PANNING SYSTEM FOR WHITE BREAD PRODUCTION LINE

Tatsuo Oshikiri, Tokyo, Japan, assignor to Kabushiki Kaisha Oshikiri Kikai Seisaku-Sho, Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,437
Claims priority, application Japan, Mar. 6, 1975, 50-27483; Mar. 6, 1975, 50-27484; Mar. 6, 1975, 50-27485; Mar. 24, 1972, 47-29552; Mar. 24, 1972, 47-34809[U]
Int. Cl.[2] A21C *9/08*
U.S. Cl. 425—140 **21 Claims**



1. An automatic panning system for white bread production line, including an elongated travel path having a plurality of work stations in series; comprising:

a. dough piece-selecting device (A) first work station which detects cylindrically formed dough pieces in a molder and transfers these one by one intermittently said device having means selecting and removing cylindrical dough pieces longer than a predetermined length and making a narrow pitch with a preceeding dough piece,

b. a centering machine (B) second work station fed by said first work station operable to transfer the selected dough pieces including sensing means for sensing for lateral deviations in a column of the transferred detected dough pieces to correct them by the deviating amount,

c. a bending machine (C) third work station fed by said second work station operable to bend the cylindrical dough peices transferred from the centering machine into predetermined shapes, and,

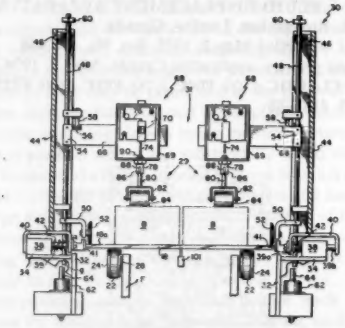
d. a circular table panning machine (D) fourth work station fed by said third work station having means to receive the bent dough pieces one by one and moving them successively to pan a plurality of the dough pieces into a bread pan.

4,036,570

CEMENTITIOUS PRODUCT MAKING SYSTEM WITH PRODUCT HEIGHT GAUGING MECHANISM

Harry F. Cruzen, and Robert W. Gresham, both of Alpena, Mich., assignors to Besser Company, Alpena, Mich.

Continuation of Ser. No. 684,154, May 7, 1976, abandoned, which is a division of Ser. No. 475,757, June 3, 1974, Pat. No. 3,963,397. This application Oct. 14, 1976, Ser. No. 732,388
Int. Cl.[2] B28B *1/08*
U.S. Cl. 425—141 **7 Claims**



2. Apparatus for gauging the height of a block which is removed from a vibratile mold comprising:

frame means;

means thereon for conveying pallets carrying blocks of cementitious material in a forward path of travel;

support means vertically movable on said frame means between a raised, inoperative position and a lowered position dependent on the level of the top of said pallet; and

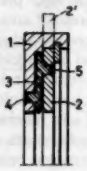
block height sensing means, mounted on said support means for vertical movement relative thereto to a level dependent upon the height of the formed block and independent of the thickness of the pallet for sensing the level of the top of the block as it moves thereby.

4,036,571

MOLDING APPARATUS FOR MAKING IRIS LEAF

Hermann Geyer, Lengfeld, Wurzburg; Albert Baab, and Paul Himmelsbach, both of Bad Kreuznach, all of Germany, assignors to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

Division of Ser. No. 551,722, Feb. 21, 1975, Pat. No. 4,009,946.
This application Nov. 14, 1975, Ser. No. 632,099
Claims priority, application Germany, Feb. 23, 1974, 2408793
Int. Cl.[2] B29F *1/14*
U.S. Cl. 425—556 R 8 Claims



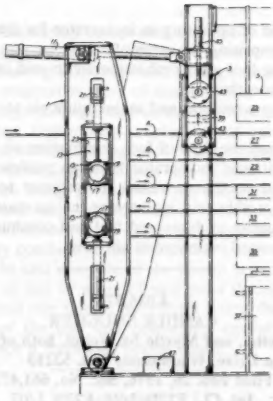
1. A mold for making an iris leaf for an optical component, comprising:
   a pair of separable mold halves with confronting surfaces forming a pair of shallow cavities therebetween and a sprue channel with branches extending from an injection gate between said cavities to respective edges of said cavities;
   a plurality of shearing bolts guided in bores transverse to said surfaces at the junctions of said branches with said edges for severing a foil-shaped body molded in each cavity from a runner in said sprue channel; and
   ejection means in one of said mold halves for disloding the molded bodies from said cavities.

4,036,572

BELT TENSIONING DEVICE FOR A VULCANIZING PRESS

Oscar Lewis Yeager, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed June 23, 1976, Ser. No. 699,116
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—338 8 Claims



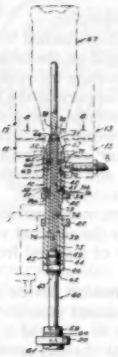
1. An apparatus for tensioning a belt in a multiplaten vulcanizing press located at one side of and adjacent to said press comprising:
   a support,
   a pivotal frame connected to said suport and having an opening,
   means for pivotally moving said frame,
   means in said opening for horizontally engaging a strand of said belt when extending from between the press platens in a manner to tension the strand in said press upon a pivotal movement of said frame away from said press and to untension the strand in said press upon a pivotal movement of said frame toward said press, and
   means for moving said belt engaging means to maintain the strand in a horizontal alignment with a platen of said press to assure a uniform tension of the strand in said press.

4,036,573

STRETCH BLOW MOLDING APPARATUS

Ivan L. Kauffman, Commerce Township, Oakland County, and Robert C. Kellogg, Hartland Township, Livingston County, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 415,850, Nov. 14, 1973, abandoned.
This application June 23, 1976, Ser. No. 699,145
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—529 2 Claims



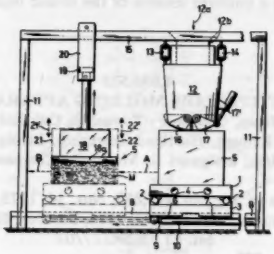
1. In a blow molding machine having a mold assembly with a longitudinal axis and an opening with a locating shoulder therein, the combination comprising:
   stretch pin means mounted in operative relation with said mold assembly having:
   a. a tubular body;
   b. a blow air nozzle mounted in said body carrying a preform having a flangelike protrusion adjacent an open end for locating and sealing said preform against said shoulder in the mold assembly;
   c. a stretch pin slidably mounted longitudinally through said blow air nozzle between retracted and extended positions for stretching said preform;
   d. first blow air passage means operatively formed through said tubular body and blow air nozzle including an annular passage adjacent the open end of the preform for admitting blow air under pressure into the preform for blowing the preform into a finished article;
   e. second air ejection passage means in the stretch pin including an outlet forward of said first blow air passage means when the stretch pin is in said extended position for ejecting the finished article from the stretch pin; and
   f. valve means responsive to the pressure of the blow air to prevent blow air from exiting through the second air ejection passage means during blowing of the article.

4,036,574

DEVICE FOR THE PRODUCTION OF CARBON BODIES

Willy Jakobs, Proz-Grengel, and Kurt Wilkens, Cologne, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 1, 1975, Ser. No. 636,544
Claims priority, application Germany, Dec 2, 1974, 2456911
Int. Cl.[2] B29C *3/00;* B30B *11/02*
U.S. Cl. 425—432 8 Claims



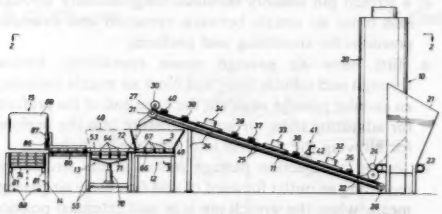
1. A mechanism for the production of carbon bodies such as electrodes for the aluminum industry comprising:
a jarring table;
a resilient mount therefor;
an oscillation exciter attached to the table;
a mold box arranged on the table;
a base frame supporting the resilient mount;
a horizonal slide supporting the base frame;
a drive for horizontally sliding the base frame on the horizontal slide between fixed first and second positions;
a material charging container above the mold selectively fixed vertically and fixed horizonally at said first horizontal charging position;
an openable closure means carried on the charging container for metering by the selected vertical position of the container the flow of material from the charging container; and
a pressing compression device and a compression weight fixed on said second position of the mold, whereby the mold box may be charged at the first position and the carbon material therein jarred and compressed at the second position; and wherein
said horizontal slide is positioned to guide the container accurately between said first and second positions.

4,036,575

CONCRETE PRODUCT MANUFACTURING SYSTEM

Douglas F. Prince, Houston, Tex., assignor to Castone Development Corporation, Houston, Tex.

Division of Ser. No. 307,154, Nov. 16, 1972, Pat. No. 3,904,723.
This application June 9, 1975, Ser. No. 584,713
Int. Cl.[2] B28B *13/02*
U.S. Cl. 425—443 7 Claims



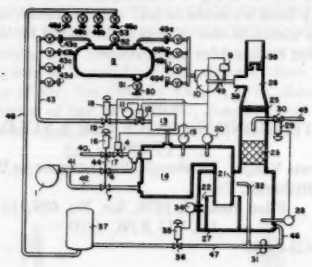
1. Concrete product manufacturing system comprising:
a. mixer means adapted to continuously receive raw materials, including aggregates, cement and liquids, and to continuously mix said raw materials to form a wet concrete mixture;
b. receiver means adjacent said mixer means for continuously receiving said wet concrete mixture from said mixer means and maintaining therein a static head above a predetermined limit, the lower portion of said receiver means forming a preload area into which a portion of said wet concrete mixture may be precompacted by the static head exerted by said wet concrete mixture in said receiver means; and
c. mold means adjacent said receiver means for repeatedly receiving charges of said precompacted wet concrete mixture from said preload area of said receiver means to form precured concrete products;
d. said mold means and said receiver means being mounted for reciprocable movement, relative to each other, from a first position in which said mold means is directly beneath said preload area of said receiver means to a second position in which said mold means is not beneath said receiver means, said receiver means being in a position at all times to receive wet concrete mixture from said mixer means to maintain said static head therein.

4,036,576

INCINERATION SYSTEM FOR THE DISPOSAL OF A WASTE GAS AND METHOD OF OPERATION

Charles Kennedy McCracken, Blue Bell, Pa., assignor to The Trane Company, La Crosse, Wis.

Filed Aug. 11, 1976, Ser. No. 713,458
Int. Cl.[2] F23G *7/06*
U.S. Cl. 431—5 16 Claims



1. A method of operating an incinerator for the disposal of a waste gas comprising the steps of:
a. admitting fuel and combustion air to said incinerator for combustion therein;
b. admitting waste gas and incineration air to said incinerator; and
c. modulating the flow of fuel, combustion air and incineration air to said incinerator between predetermined minimum and maximum values in response to temperature changes within said incinerator, an increase in temperature resulting in decreased fuel and combustion air flow and increased incineration air flow.

4,036,577

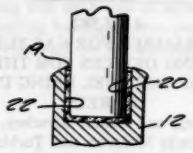
CANDLE SNUGGER

Robert D. Veitel, and Myrtle M. Veitel, both of 1333 Martha Washington Drive, Wauwatosa, Wis. 53213

Filed Feb. 26, 1976, Ser. No. 661,473
Int. Cl.[2] F23D *3/16;* F23N *5/02*
U.S. Cl. 431—35 1 Claim

1. In combination a candle with a candle butt and a candle holder with an opening, a compressible and yieldable circular disk of polyurethane foam having opposed friction surfaces and a diameter greater than the diameter of the butt of the candle, said disk being adapted to be concentrically positioned

with respect to the holder opening and to form a pocket around the candle occupying the space between the candle and the candle holder opening to encapsulate the butt of the candle and secure the candle in the holder said disk being sized with respect to the diameter of the candle so that the disk has an



upper margin arranged around the periphery of the candle adjacent the top of the candle holder and wherein the disk is treated with a heat activated composition which gasifies when exposed to the candle flame to snuff out the candle as the candle burns proximate said disk.

4,036,578

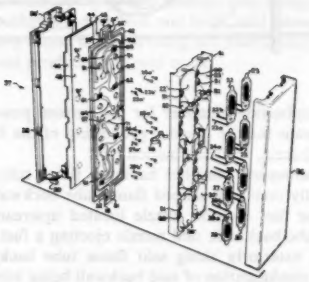
PHOTOFLASH ARRAY AND METHOD OF CONSTRUCTION

Richard M. Herman, Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 13, 1976, Ser. No. 686,145

Int. Cl.[2] F27D *1/08*

U.S. Cl. 431—98 **10 Claims**



1. A photoflash array comprising a plurality of flash lamps each having pair of lead-in wires, a circuit board carrying circuitry for flashing said lamps and having pairs of connector areas for the respective pairs of lead-in wires of said lamps, pairs of openings through said circuit board at said pairs of connector areas, respectively, a plurality of pairs of eyelets respectively positioned through said pairs of openings with the eyelet shanks extending from one side of said circuit board, said flash lamps being positioned over the other side of the circuit board and their pairs of lead-in wires respectively extending into and connected to said pairs of eyelets, and a sheet-like electrically conductive shield member positioned substantially parallel to said one side of the circuit board, one of the eyelet shanks of one or more of said pairs thereof extending farther from said one side of the circuit board than the other eyelet shank of the pair and contacting against said shield member to space it from said circuit board.

4,036,579

LIGHTER

William E. Marynissen, Old Greenwich, Conn., assignor to Bic Pen Corporation, Milford, Conn.

Filed Apr. 30, 1975, Ser. No. 573,384

Int. Cl.[2] F23Q *2/08, 25/00, 1/02*

U.S. Cl. 431—131 **9 Claims**

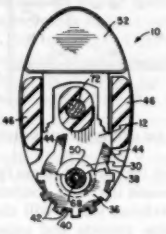
1. A lighter for burning a fuel of a type capable of providing a combustible gas upon being permitted to expand under atmospheric pressure which comprises:

a. a body member defining an internal chamber for containing a supply of fuel, said fuel chamber further defining a fuel supply opening through which the fuel may pass;

b. an extension positioned on said body member and defining an output orifice which is communicable with said fuel supply opening in such a manner that fuel permitted to pass through said fuel supply opening is directable to said extension for projecting a flame from said output orifice;

c. selectively operable valve means positioned and structured for selective movement from a first position which seals said fuel supply opening and prevents fuel from passing therethrough to a second position which permits fuel to pass from said fuel supply opening to said output orifice;

d. fuel expansion control means positioned intermediate said internal chamber and said extension and constructed of a material which is structured and adapted for selectively varying the fuel permitted to pass through said fuel supply opening, independent of said selectively operable fuel valve means, to vary the height of the flame produced by said expansible fuel in proportion to the amount of fuel permitted to pass;



e. a rotatably mounted control member defining a plurality of radial extending teeth about the periphery, said control member being operatively connected to said fuel expansion control means to adjust the fuel expansion control means in relation to the angular position of the control member with the control member being rotatable from a first limit position which substantially restricts expansion of fuel from said fuel supply opening to said output orifice and a second limit position which permits relatively unrestricted fuel expansion through said fuel supply opening; and

f. at least one limit member positioned about said control member and having deformable tab means bendable between at least two of said radial extending teeth to prevent selective relative rotary movement of said limit member and control member while causing said limit member to rotate therewith, said limit member having at least one leg member positioned and dimensioned to engage a wall portion of said body member to limit at least the maxium amount of fuel permitted to expand through said fuel expansion control means when said fuel valve means is in the open position.

4,036,580

TURBINE-DRIVEN AIR-POWERED FLARE

Robert D. Reed; Robert E. Schwartz, and Roger K. Noble, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed June 4, 1976, Ser. No. 693,000

Int. Cl.[2] F23D *13/20*

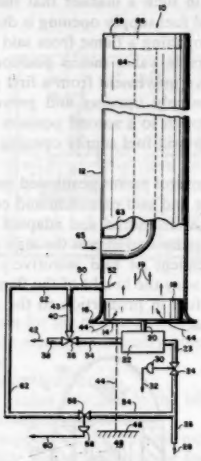
U.S. Cl. 431—202 **9 Claims**

1. In an air powered flare combustion apparatus comprising:

a. a flare stack, comprising an outer cylindrical wall;

b. primary air driving means, mounted at the upstream end of said flare stack;

c. internal cylindrical conduit means for the flow of waste gases to be flared;
d. burner means for burning said waste gases attached to said internal conduit and positioned at the downstream end of said outer cylindrical wall, and ignition means;
the improvement in means to provide complete and smokeless combustion of said waste gases, comprising;



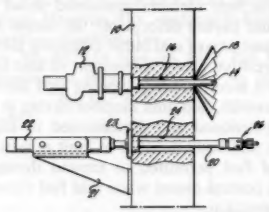
e. said primary air driving means comprising steam powered means; and
f. means to inject the exhaust steam from said steam powered air driving means into said combustion apparatus;
whereby said exhaust steam will chemically participate in the combustion process and assist in the complete and smokeless combustion of said waste gases.

4,036,581

IGNITER

David R. Keyser, Churchville, and Pierce H. Zavod, King of Prussia, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 3, 1976, Ser. No. 720,310
Int. Cl.[2] F23Q *1/00*
U.S. Cl. 431—267 **6 Claims**



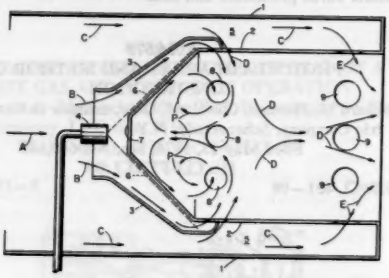
1. An igniter, comprising:
a manifold, adapted to receive pressurized gas, provided with a nozzle adapted to pass the gas therethrough;
a chamber connected to said manifold and provided with a plurality of orifices;
a first hollow tube, centrally mounted on said chamber opposite the nozzle, having a closed end and an open end forming a resonant cavity, the closed end being distant from said chamber and the open end opening into said chamber and being adapted to receive the gas from the nozzle; and
a cluster of second hollow tubes, arranged about said first hollow tube, mounted on said chamber opposite the nozzle, each of said second tubes having a closed end and an open end forming a resonant cavity, the closed end being distant from said chamber and the open end opening into said chamber and being adapted to receive the gas from the nozzle.

4,036,582

COMBUSTION CHAMBER FOR GAS TURBINE POWER PLANTS HAVING DEVICES FOR THE GASEOUS PROCESSING OF THE FUEL BEING INTRODUCED THEREIN

Adolf Fehler, Pfaffing, and Günter Kirschey, Munich, both of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Oct. 31, 1975, Ser. No. 627,918
Claims priority, application Germany, Nov. 2, 1974, 2452178
Int. Cl.[2] F23Q *9/08*
U.S. Cl. 431—352 **5 Claims**



1. In a combustion chamber for gas turbine power plants including means for the gaseous processing of the fuel being introduced therein, the combination of:
a. said combustion chamber having a flame tube with an essentially conically shaped flame tube backwall; and at least one fuel ejection nozzle located upstream of said flame tube backwall, said nozzle ejecting a fuel cone extending exteriorly along said flame tube backwall, the conical configuration of said backwall being substantially similar to that of said fuel cone;
b. and an air infeed hood surrounding said flame tube backwall and at least partly said fuel ejection nozzle, said hood and said flame tube backwall forming an annular passageway decreasing in cross-section in the downstream direction of said flame tube backwall; and a plurality of apertures in the side walls of said flame tube arranged directly adjacent said flame tube backwall and providing communication between said annular passageway with the interior of said flame tube.

4,036,583

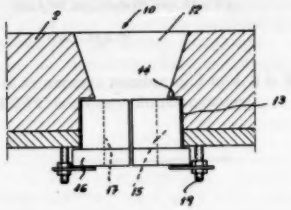
ROTARY FURNACE FOR THE CONTINUOUS MANUFACTURE OF SOLID ALKALINE SILICATES

Jose Felip Sugranes, Valencia, Spain, assignor to Foret, S. A., Barcelona, Spain

Continuation of Ser. No. 541,689, Jan. 16, 1975, abandoned. This application Apr. 8, 1976, Ser. No. 675,217
Int. Cl.[2] F27B *7/32*
U.S. Cl. 432—117 **3 Claims**

1. A rotary furnace for the continuous manufacture of solid alkaline silicates, said rotary furnace comprising:
an inclined rotary tubular body;
means at the higher end of said body for continuously charging therein materials to be treated;
heating means at the lower end of said body for melting said materials; and

means for continuously discharging the resulting product from said body, said discharging means comprising at least one outlet opening formed through the side wall of said body, each said at least one outlet opening being located adjacent said lower end of said body, said body being free of openings between said at least outlet opening and said higher end of said body, and a bushing of refractory material extending into each said at least one outlet opening, each said bushing having an open passage extending completely therethrough to the atmosphere exterior of said



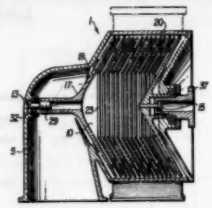
body, there being free and open communication between the interior of said body and the exterior atmosphere through said outlet opening and said passage, each said passage having an area less than the area of the respective said outlet opening, said passage area being the same for all bushings mounted in said body, said passage area comprising means for controlling the desired rate of discharge of said product from said body.

4,036,584

TURBINE

Benjamin G. Glass, 3011 Stockett Way, San Diego, Calif. 92117

Filed Dec. 18, 1975, Ser. No. 642,169
Int. Cl.[2] F01D *1/36*
U.S. Cl. 415—90 8 Claims



1. A turbine comprising a housing and a circular rotor journalled within said housing, fluid inlet means in said housing and said inlet means extending substantially tangentially with respect to said rotor, said rotor comprising an assembly of adjacent circular members and the rear faces of said circular members having raised spiral fence baffles that affix and space adjacent members with respect to one another and define an expanding fluid channel towards exhaust openings in the centers of these members, the openings of the circular members intermediate the end members of said assembly being obstruction-free and the axis of rotation of said rotor extending through said exhaust openings, a front end member of said rotor comprising a web with exhaust slots and having an outer convex side, a central stem on said convex side being journalled to said housing with shaft means, a rear end member of said rotor comprising a coupling that is journalled to the rear of said housing.

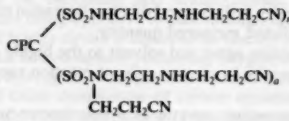
4,036,585

BLEEDFAST PHTHALOCYANINE DYES FOR PAPER

Daniel Shaw James, Hockessin, and Vincent Gerard Witterholt, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1976, Ser. No. 713,038
Int. Cl.[2] D06P *1/14;* C09B *47/04*
U.S. Cl. 8—1 XA 5 Claims

1. A dye of the formula



wherein n is an average number of 3 to 4, a is 0 to 3 but less than n, and CPC is copper phthalocyanine.

4,036,586

PROCESS FOR OXIDIZING SULFUR DYES

Marvin Herbert Rowe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 16, 1975, Ser. No. 622,889
Int. Cl.[2] C09B *49/00;* D06P *1/30*
U.S. Cl. 8—37 4 Claims

1. In the continuous process of oxidizing sulfur dyes on cellulosic fibers by contacting said fibers containing said dye in a reduced state with a hydrogen peroxide solution comprising decomposition inhibitors, the improvement wherein the hydrogen peroxide solution of 0.1 % to 0.5 % by weight of H_2O_2 and a pH of from 2 to 7 comprises from 0.01 to 0.2 gram of a water-soluble copper salt per liter of said peroxide solution.

4,036,587

PROCESS FOR DYEING CELLULOSE FIBERS

Hans Wolf, Ludwigshafen; Jozsef Gerendas, Neustadt, and Ernst Wilhelm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 2, 1975, Ser. No. 609,562
Claims priority, application Germany, Sept. 19, 1974, 2444823
Int. Cl. C09b *69/00*
U.S. Cl. 8—92 6 Claims

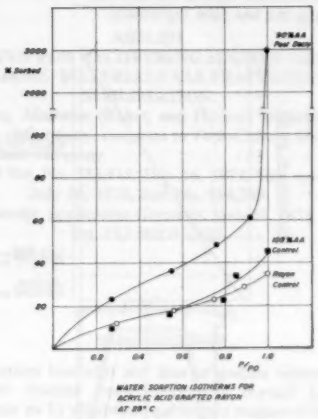
1. A process for the dyeing of cellulose fibers or mixtures of cellulose fibers with synthetic fibers which comprises dyeing a textile material made of said cellulose fibers or said mixtures of fibers by the exhaustion method in an aqueous liquor that had been used in the acid pre-treatment of said fibers and containing a dye for cellulose fibers and, as a dyeing assistant and complexing agent, from 0.05 to 2% by weight, based on the material being dyed, of a water-soluble polymer selected from the group consisting of water-soluble homopolymers of acrylic acid, water-soluble copolymers of acrylic acid with up to 50% by weight of methacrylic acid, methacrylamide, acrylamide, acrylonitrile, methacrylonitrile, esters of acrylic acid and methacrylic acid, crotonic acid and itaconic acid, copolymers of maleic acid with styrene, copolymers of maleic acid with vinyl esters, copolymers of maleic acid with vinyl ethers and the alkali metal and ammonium salts of the said polymers, said polymer having a viscosity of 7.5% by weight solution of the polymer in water at a pH of 9 and a temperature of 20° C of from 1 to 300 centipoises.

4,036,588

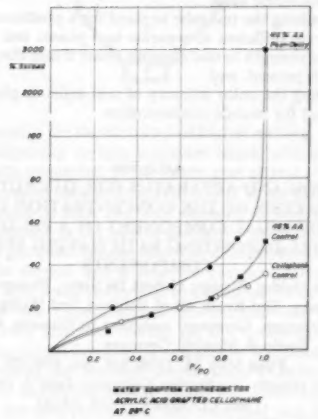
METHOD OF INCREASING THE WATER ABSORPTION OF CELLULOSE-CONTAINING MATERIALS

Joel Lawson Williams, Cary, and Vivian Thomas Stannett, Raleigh, both of N.C., assignors to Research Corporation, New York, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,181
Int. Cl.[2] D06M *13/20, 13/30, 13/34, 5/24*
U.S. Cl. 8—130.1 17 Claims



WATER SORPTION ISOTHERMS FOR ACRYLIC ACID GRAFTED RAYON AT 25° C



WATER SORPTION ISOTHERMS FOR ACRYLIC ACID GRAFTED CELLOPHANE AT 25° C

1. In a process for imparting water-absorbent properties to a cellulose-containing material by graft-copolymerizing onto said material at least one vinyl monomer containing a hydrophilic group the improvement comprising treating said graft-copolymerized material with a decrystallizing agent for cellulose in an amount and for a time sufficient to increase the water absorbency of the graft copolymerized material.

4,036,589

DETERMINING THE CONCENTRATION OF A BIOCIDE ADDITIVE IN A LIQUID

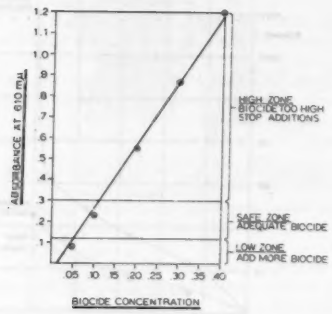
Robert Daniel King, Mill Valley, Calif., assignor to J. R. Schneider Co., Inc., Tiburon, Calif.

Continuation-in-part of Ser. No. 588,517, June 19, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 668,868
Int. Cl.[2] B01D *17/04;* G01N *33/16*
U.S. Cl. 23—230 B 14 Claims

1. A method for determining the biocide concentration in an

oil-water emulsion containing a biocide that in acid aqueous solution liberates material reacting with a modified Schiff's reagent, comprising the following steps:

1. providing said oil-water emulsion containing a biocide that in acid aqueous solution liberates material reacting with a modified Schiff's reagent,
2. adding a predetermined sample of said emulsion to a test tube containing (a) a lower aqueous phase solution for breaking said emulsion, and (b) an upper phase of a non-water-miscible solvent for said oil,
3. shaking the test tube vigorously,



4. thereafter adding to said test tube and mixing with the liquid therein a predetermined amount of modified Schiff's reagent consisting essentially of an aqueous solution of rosaniline hydrochloride, sodium bisulfite, and hydrochloric acid,
5. permitting the test tube to stand for a predetermined time interval sufficient to separate said phases and to develop color strength in said aqueous phase if said liberated material is present, and
6. reading the color intensity of said aqueous phase, as calibrated for biocide concentration.

4,036,590

METHOD AND APPARATUS FOR THE AUTOMATIC ANALYSIS OF THE CONCENTRATION OF AN INDIVIDUAL COMPONENT OF A FLUID IN A METAL-DEPOSITING BATH HAVING SEVERAL COMPONENTS

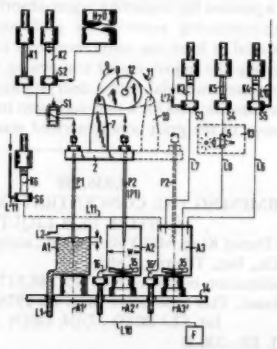
Johannes Helder, Brugge; Hubert De Steur, Drongen; Marc De Vogelaere, Sint-Kruis, all of Belgium, and Wolfgang Pernegger, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 25, 1976, Ser. No. 689,925

Claims priority, application Germany, June 3, 1975, 2524611

Int. Cl.[2] G01N *21/24, 33/20*

U.S. Cl. 23—230 R **3 Claims**



1. A method for the automatic analysis and determination of the magnitude of specific components of a bath fluid having a plurality of components in a metal-depositing bath, comprising the steps of:

a. pumping the bath fluid for several minutes in a circulation system located partially outside the bath;

b. taking a sample quantity from the circulation system and diluting the sample quantity in at least first and second dilution operations including the step of,

i. removing a diluted measured fractional quantity from the first dilution operation and again diluting that fractional quantity in the second dilution operation to create a highly diluted measured quantity;

c. adding a reaction agent and solvent to the highly diluted measured quantity to create a solvent-reaction agent mixture;

d. rinsing a measuring cuvette of a colorimeter with the solvent-reaction agent mixture; and

e. colorimetrically measuring the solvent-reaction agent mixture to determine the magnitude of the specific bath component.

4,036,591

METHOD FOR PLACING A CORROSION TEST SPECIMEN INTO AN ENVIRONMENT TO BE TESTED

Herman F. Stanfill, Brea, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Aug. 18, 1976, Ser. No. 715,241

Int. Cl.[2] G01N *31/00, 33/20*

U.S. Cl. 23—230 C **6 Claims**

1. A method for passing a corrosion test specimen through a contaminating environment and into an environment to be tested, which comprises:

encapsulating said specimen in ice; and

passing said specimen through said contaminating environment and into said test environment.

4,036,592

DETECTION OF CARBON MONOXIDE

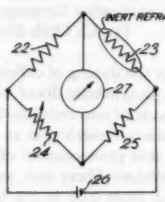
David Keith Brown; David William Dabill; Jack Graham Firth; Alan Jones, and Thomas Alwyn Jones, all of Sheffield, England, assignors to National Research Development Corporation, London, England

Filed May 28, 1975, Ser. No. 581,697

Claims priority, application United Kingdom, June 5, 1974, 25045/74

Int. Cl.[2] G01N *27/16, 31/12;* **H01C** *3/00*

U.S. Cl. 23—232 E **9 Claims**



1. A method of testing an oxygen-containing atmosphere for the presence of carbon monoxide, the method comprising:

bringing said atmosphere into contact with a catalyst consisting of a platinum base alloy containing rhodium in a proportion of not less than about 10% by weight while maintaining said catalyst at a temperature such that it is capable of causing combustion of carbon monoxide but will not readily cause combustion of hydrogen in said atmosphere; and

sensing any thermal effect on said catalyst caused by the occurrence thereon of a combustion reaction.

8. An apparatus for use in gas detection, the apparatus comprising:

a Wheatstone bridge circuit in adjacent arms of which are respectively connected similar resistors respectively constituted by first and second coils of wire each consisting of a platinum base alloy containing rhodium in a proportion of not less than about 10% by weight, said second coil being embedded in a bead of an inert refractory material and said first coil and said bead being exposed for contact with an atmosphere to be tested;

means for energising said bridge circuit, said energising means being operative to pass through said first coil when said bridge circuit is balanced an electric current such that when an atmosphere containing oxygen, carbon monoxide and hydrogen is brought into contact with said first coil it will cause combustion of carbon monoxide but will not readily cause combustion of hydrogen; and

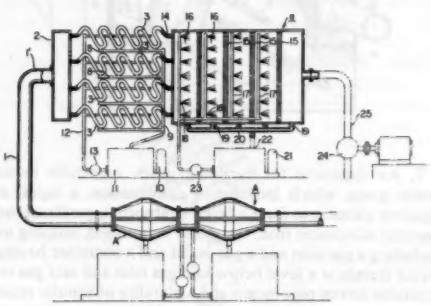
means responsive to an out-of-balance condition of said bridge circuit.

4,036,593

APPARATUS FOR PURIFICATION OF EXHAUST GASES

Shinobu Satoh, No.1-51, Hizumi 1-chome, Kashiwazaki, Niigata, Japan

Division of Ser. No. 453,192, March 21, 1974, Pat. No. 3,961,019. This application Mar. 1, 1976, Ser. No. 662,433
Claims priority, application Japan, Mar. 30, 1973, 48-36992
Int. Cl.[2] B01D *25/08, 47/06;* B01J *1/00*
U.S. Cl. 23—260 6 Claims



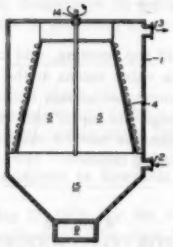
1. An apparatus for purifying an exhaust gas emitted by a combustion operation and flowing through a flue, comprising: a first reaction purifier comprising one or a plurality of sinuous gas flow conduits connected at one end to said flue for receiving exhaust gas therefrom, said gas flow conduit or conduits having upper reversely curved bends connected by intermediate upright sections to lower reversely curved bends; a plurality of serially arranged first nozzles located in said upright sections for injecting jets of pressurized aqueous solution of alkaline material into the exhaust gas flowing through said upright sections for reaction with said exhaust gas, all of said nozzles in said upright sections being arranged to inject said aqueous solution in the same lengthwise direction in said upright sections and in the same direction as the direction of flow of the exhaust gas in said upright sections so as to add energy to and react with said exhaust gas; discharge conduits connected to said lower reversely curved bends for removing said aqueous alkaline solution and precipitates contained therein; a second reaction purifier comprising a shower box having one end thereof connected to the other end of said gas flow conduit or conduits, said shower box containing a plurality of serially arranged, generally planar, upright, horizontally spaced-apart glass fiber mats extending transverse to the direction of gas flow through said shower box, a plurality of second nozzles disposed upstream of and in confronting relationship to each of said mats for directing streams of an aqueous solution of oxygen-generating material toward the mats, all of said second nozzles being arranged to direct said streams of aqueous solution of oxygen-generating material in the same direction in said shower box and in the same direction as the direction of flow of the exhaust gas in said shower box, and exhaust port means connected to the lower end of said shower box for removing said aqueous solution of oxygen-generating chemical from said shower box; and exhaust conduit means connected to said shower box downstream of the last mat therein for removing purified exhaust gas from said shower box.

4,036,594

APPARATUS FOR RECOVERING HIGHER MELTING ORGANIC MATERIALS VIA FRACTIONAL SUBLIMATION

Gunter Ibing, Mulheim (Ruhr), and Herbert Haferkorn, Bottrop, both of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Division of Ser. No. 533,416, Dec. 16, 1974. This application July 16, 1975, Ser. No. 596,349
Claims priority, application Germany, Dec. 17, 1973, 2362659
Int. Cl.[2] B01D *7/02*
U.S. Cl. 23—264 7 Claims



1. An apparatus for the recovery of higher melting, organic materials comprising upright container means with gas inlet means laterally connected to the lower part of said container means, a gas outlet means connected to the upper part of the container means, at least one wall opposed to said gas inlet means and disposed in the path of gas flow from said gas inlet means to said gas outlet means, said wall defining a zone on the upstream side thereof and a zone on the downstream side thereof, said wall being perforated to permit gas to flow from said upstream side thereof to said downstream side thereof, said wall having attached thereto on the downstream side thereof cooling means comprising at least one thermostatically controlled cooling coil through which passes a cooling fluid, said apparatus having collection means for collecting solids deposited on the upstream side of said wall, said wall being at least partially opposed to a bottom portion of said apparatus and tapering downward with means for product removal.

4,036,595

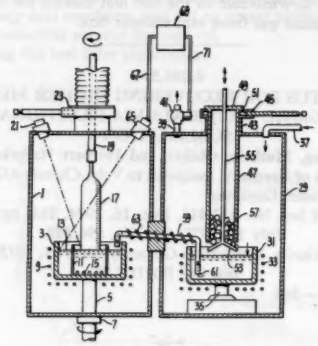
CONTINUOUS CRYSTAL GROWING FURNACE

Robert E. Lorenzini, Menlo Park; Akiyoshi Iwata, Sunnyvale, and Karl Lorenz, Redwood City, all of Calif., assignors to Siltec Corporation, Menlo Park, Calif.

Filed Nov. 6, 1975, Ser. No. 629,609
Int. Cl.[2] B01J *17/18*
U.S. Cl. 23—273 SP 4 Claims

1. In an apparatus for growing a semiconductor crystal from a melt of a semiconductor material maintained in a first crucible, said first crucible being enclosed in a first chamber, the improvement comprising a second crucible having means for melting solid material to provide a melt in said second crucible and means for introducing said molten material from said second crucible to said first crucible, said means including a tube extending into the molten material of the second crucible whereby liquid is withdrawn from the second crucible from a

point between the bottom of the crucible and the top surface of the melt, said second crucible being mounted in an enclosed second chamber separate from said first chamber, said second chamber having a top opening leading to said second chamber, said top opening having valve means to selectively close or open said top opening, and a tight fitting cannister adapted to



be inserted into said top opening, said cannister being elongated and having a valve means at the bottom thereof and operating means connected to said bottom valve means and extending out through the top of the cannister whereby the contents of the cannister can be selectively introduced by actuating said operating means.--

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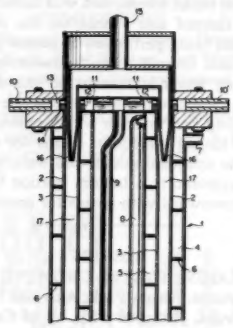
4,036,596

APPARATUS FOR CONTINUOUS SULFONATION

Toshiaki Ogoshi, Funabashi; Yozo Miyawaki; Fusao Kondo, both of Chiba, and Susumu Sakurai, Narashino, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed June 25, 1976, Ser. No. 699,712
Claims priority, application Japan, June 30, 1975, 50-80645
Int. Cl.[2] B01J *10/00*; C07B *13/06*
U.S. Cl. 23—283 **6 Claims**



1. In an apparatus for continuous sulfonation comprising at least one vertically extending, cylindrical reaction wall having a reaction surface down which a liquid material to be sulfonated flows in the form of a thin film, and at least one annular nozzle for feeding a gaseous sulfonating agent to a corresponding reaction zone, wherein the improvement comprises an annular feeding device mounted on an upper end of said at least one cylindrical reaction wall for feeding said liquid material to be sulfonated to said reaction surface, and having a number of rectangular slots horizontally equidistantly arranged in a row; and in the percentage of slot area expressed by the formula:

$$\frac{a \times c}{a(b + c)} \times 100$$

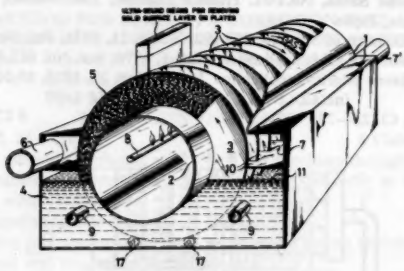
where a represents the vertical clearance of the opening of each slot and is in the range of 0.2 mm to 1.0 mm; b the interval between two adjacent slots; and c the horizontal width of opening of each slot; said a, b and c are so chosen as to permit said percentage of slot area to range from 40 to 90%.

4,036,597

APPARATUS FOR PURIFYING GASES

Peter Filss, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Division of Ser. No. 380,619, July 19, 1973, Pat. No. 3,907,967.
This application May 21, 1975, Ser. No. 579,372
Claims priority, application Germany, July 25, 1972, 2236389
Int. Cl.[2] B01J *10/00*
U.S. Cl. 23—284 **9 Claims**



7. An apparatus for purifying gases, especially industrial waste gases, which includes in combination: a liquid as an aqueous solution to form a layer to absorb impurifications and harmful substances from the gas to be purified, housing means including a gas inlet and a gas outlet and a container having the liquid therein at a level below said gas inlet and said gas outlet, rotatable driven pipe means and a plurality of annular rotatable plate means coaxially mounted on said pipe means for rotation therewith, said plate means being axially spaced from each other by a few millimeters and the pipe means being rotatably journalled in the housing means so that said plate means are immersed only partially in such liquid and, when the pipe means and plate means rotate, a layer of liquid is formed on said plate means above the level of said liquid, and means connected to and in contact with said pipe means to evaporate the liquid on said plates to form a solid surface layer capable of adsorbing and chemically reacting with impurifications and harmful substances from the gas to be purified, and means in said liquid for removing impurifications and harmful substances adsorbed from the gas and chemically fixed by said solid surface layer from said annular plate means.

4,036,598

MECHANICAL VIBRATOR FOR USE IN MATERIAL TRANSPORT APPARATUS AND THE LIKE

Albert M. Soldate, 276 Hacienda Drive, Arcadia, Calif. 91006

Division of Ser. No. 420,692, Nov. 30, 1973, Pat. No. 3,915,890.
This application June 2, 1975, Ser. No. 583,031
Int. Cl.[2] B01J *8/40*; F01N *3/15*
U.S. Cl. 23—288 B **18 Claims**

1. Catalyst regeneration apparatus comprising:

a. a closed circuit for simultaneously utilizing and regenerating a particulate catalyst circulated through the closed circuit, the closed circuit including a reaction chamber of closed cross-section having a spaced apart inlet and outlet,

a regeneration chamber of closed cross-section having a spaced apart inlet and outlet, and gas seal conduit means of closed cross-section in which the reaction chamber outlet communicates by a tubular feed conduit with the regenerator inlet, and the regenerator outlet communicates by a tubular return conduit with the reaction chamber inlet;

b. means mounting the closed circuit in a substantially horizontal position;

c. a predetermined quantity of a particulate catalyst contained in the closed circuit;

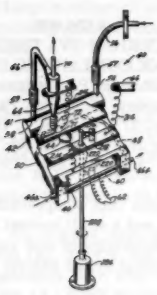
d. means for introducing a stream of reactant gas to the reaction chamber;

e. means for withdrawing said stream of reactant gas from the reaction chamber;

f. means for passing said stream of reactant gas through the reaction chamber to contact the particulate catalyst contained in the reaction chamber prior to the gas being withdrawn from the reaction chamber to promote suitable reactions between components of the reactant gas;

g. means for regenerating spent catalyst particles passing through the regeneration chamber;

h. means for vibrating the horizontally disposed closed circuit as a unit to continuously circulate said catalyst particles in a fluidized, generally random cross-sectional dispersion through the closed circuit so that the particles travel in the reaction chamber and then through the feed conduit, the regeneration chamber, and the return conduit, and then back to the reaction chamber, to allow spent catalyst to be constantly regenerated from its passage through the regeneration means, the vibrating means causing said catalyst particles to travel in a preselected direction between the inlet and outlet of the reaction chamber; and



i. means for passing the stream of reactant gas through the reaction chamber in a direction opposite to the fluidized flow of catalyst particles therein;

j. said quantity of catalyst particles and the cross-sectional dimensions of the gas seal conduit means both being sufficient to cause the catalyst particles to circulate through said conduit means in a generally uniform, substantially completely filled cross-sectional dispersion to provide resistance to appreciable gas flow through the inlet and outlet openings of the reaction chamber so that regeneration of the catalyst particles takes place in the regeneration chamber without being affected by reactions between the reactant gas and the fluidized catalyst particles circulating through the reaction chamber.

4,036,599

POLYCRYSTALLINE ALUMINA FIBERS AS REINFORCEMENT IN MAGNESIUM MATRIX

Ashok Kumar Dhingra, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 378,624, July 12, 1973, abandoned. This application Aug. 15, 1975, Ser. No. 604,933

Int. Cl.[2] B32B *5/00, 15/14*

U.S. Cl. 428—608 **2 Claims**

1. A fiber-reinforced metal composite consisting essentially of

A. substantially aligned, continuous, polycrystalline alumina fibers which are substantially all alpha alumina and have

1. a diameter of about 15 to 30 microns,
2. a microscopic roughness height between 0.20 and 0.40 micron,
3. a microscopic roughness period between 0.8 and 1.5 micron, and
4. a tensile strength of at least about 125,000 pounds per square inch after removal from the composite, said fibers comprising between about 50 and 80 percent of the composite by volume; and

B. a matrix of magnesium or magnesium alloy containing at least 90 percent magnesium by weight and having an average grain size in the composite of less than about 4 microns.

4,036,600

STEEL SUBSTRATE ELECTROPLATED WITH Al POWDER DISPERSED IN Zn

Hajime Kimura; Takahisa Yoshihara, and Shunichi Harada, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 27, 1976, Ser. No. 690,737

Claims priority, application Japan, June 5, 1975, 50-67094

Int. Cl.[2] B32B *15/18, 15/20;* **C25D** *15/00*

U.S. Cl. 428—555 **8 Claims**

1. A composite comprising a steel sheet substrate having electrolytically plated thereon a layer consisting essentially of 1.5–70% by weight of aluminum dispersed in zinc, said layer having been plated electrolytically from an electrolytical zinc plating bath containing dispersed aluminum powder of a particle size of at least 100 meshes (at most 147 μm diameter) while agitating said bath, said composite being characterized by the substantial absence of a detrimental alloy layer of iron and of zinc-aluminum at the interface of said substrate and said layer.

4,036,601

CORROSION-RESISTANT TURBINE BLADES AND METHOD FOR PRODUCING THEM

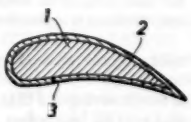
Peter Weimar, and Franz Bauer, both of Karlsruhe, Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Mar. 26, 1975, Ser. No. 562,158

Claims priority, application Germany, Mar. 26, 1974, 2414641

Int. Cl.[2] B32B *15/00*

U.S. Cl. 428—663 **12 Claims**



1. Turbine blade comprising a core of a highly heat-resistant alloy and a highly heat-resistant, nonporous, corrosion-resistant, metallic protective cover fitted onto said core and forming a gas-tight metallurgical bond therewith, said protective cover having great strength, high ductility and a uniform layer thickness, wherein the core is made of a molybdenum-rhenium alloy having a rhenium content of from 30 to 50 weight percent, the

remainder molybdenum, and the protective cover is made of a metal selected from the group consisting of rhenium, rhodium, iridium, and platinum, said metal having a high melting point and being resistant to oxidation in air at temperatures of about 1200° C.

4,036,602

DIFFUSION COATING OF MAGNESIUM IN METAL SUBSTRATES

Michael F. Dean, and Roy L. Blize, both of San Antonio, Tex., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,619
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—621 22 Claims

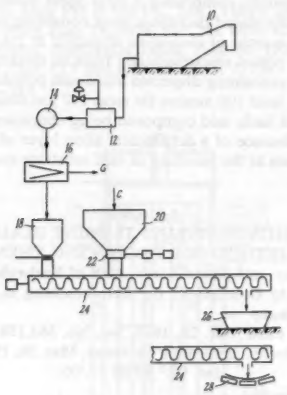
1. As an article of manufacture, a metal substrate characterized by an adherent protective coating comprised of a sacrificial thermally diffused coating bonded to said sustrate comprising at least one intermetallic compound of magnesium with a magnesium-reacting matrix metal selected from the group consisting of silver, copper, nickel, cobalt, cerium, silicon, tin and zinc, said sacrificial coating being anodic to said metal substrate.

4,036,603

APPARATUS FOR REMOVING SOLID MATTER FROM COAL TAR

Henri Georges Bernet, Sceaux, France, and Théophile Martens, Ertvelde, Belgium, assignors to Societe Francaise d'Etude d'Installations Siderurgiques Sofresid, Montreuil, France and S.A. Sidmar, Gent, Belgium

Filed Jan. 23, 1975, Ser. No. 543,770
Claims priority, application France, Apr. 25, 1974, 74.14375
Int. Cl.[2] B30B *11/00;* C10L *5/22;* C10C *1/00*
U.S. Cl. 44—13 5 Claims



1. An apparatus for removing solid matter from coal tar recovered from a coal distillation operation, said apparatus comprising:

heating means for reheating said coal tar to achieve a desired degree of fluidity thereof;

centrifuging means for receiving the thus reheated coal tar and separating said coal tar into a first, liquid phase consisting of tar which is substantially free of residual solids and a second, solid phase consisting of solid matter wetted with tar;

a duct positioned to receive said second, solid phase from said centrifuging means;

an elongate screw mixer positioned to receive adjacent a first end thereof said second, solid phase from said duct;

hopper means for supplying a solid carbon-containing material to said screw mixer at a position downstream from said first end thereof; and

said screw mixer comprising means for mixing said carbon-containing material with said second, solid phase to improve the handling properties of said second, solid phase.

4. An apparatus as claimed in claim 1, further comprising briquetting press means provided at a second end of said screw mixer for pressing into briquettes the mixture of said second, solid phase and carbon-containing material.

4,036,604

FUEL

David L. Simon, 120 Dawn Drive, Centerreach, N.Y. 11720

Filed Aug. 13, 1974, Ser. No. 497,135
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—53 14 Claims

1. A process for making an internal combustion engine fuel comprising;

a. preparing a batch by mixing, on a volume basis,

1—8 parts turpentine

1—4 parts alcohol comprising an alcohol from the group of methyl or ethyl alcohol

7—20% of a blending agent from the group comprising an aldehyde or a ketone, and

(b) reducing the temperature of the batch to below the intended operating temperature, at most 10° F, of the fuel to cause said batch to separate out into two phases based on density.

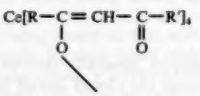
4,036,605

CHELATES OF CERIUM (IV), THEIR PREPARATION AND GASOLINE CONTAINING SAID CHELATES

Robert J. Hartle, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 177,148, Sept. 1, 1971, abandoned. This application June 11, 1973, Ser. No. 368,566
Int. Cl.[2] C10L *1/30*
U.S. Cl. 44—68 13 Claims

1. A gasoline motor fuel composition comprising a major amount of gasoline and a small amount, sufficient to improve the antiknock characteristics of said gasoline, of a chelate of cerium (IV) represented by the general formula



where R and R′ are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl and cycloalkyl radicals containing from 1 to 12 carbon atoms and the sum of the carbon atoms in said radicals is 3 to 24.

4,036,606

METHOD OF CLEANING GASES AND APPARATUS THEREFOR

Fritz Zimmermann, Essen-Steele, and Arthur Lenk, Essen-Borbeck, both of Germany, assignors to STEAG Aktiengesellschaft, Essen, Germany

Filed Aug. 29, 1975, Ser. No. 608,930
Claims priority, application Germany, Sept. 19, 1974, 2444819
Int. Cl.[2] C10J *3/68;* B01D *47/06*
U.S. Cl. 48—77 4 Claims

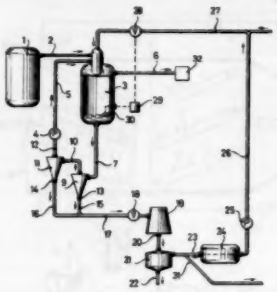
1. An apparatus suitable for cleaning gases generated by the pressurized gasification of coal by removing impurities of tar, dust and salts therefrom comprising:

a pressurized coal gasification unit, generating a crude gas stream containing tar, dust and salts,

a scrubbing unit connected to the coal gasification unit and

receiving the crude gas stream containing tar, dust and salts and having means for contacting the crude gas stream with wash water,

a plurality of hydrocyclones having their discharge members in a series and operably connected to said scrubbing unit for separating from said wash water, a concentrate stream containing said tar, dust and salts,



a wash water pump operably connected to said scrubbing unit and to said discharge member of one of said hydrocyclones for circulating wash water through said scrubbing unit, and

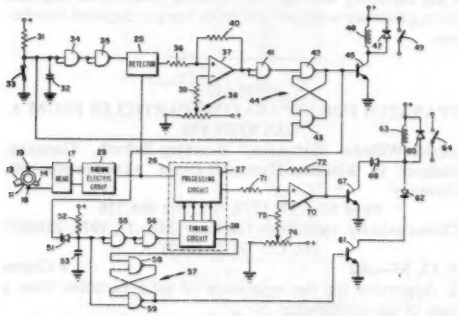
a sedimentation separating tank operably connected to the concentrate discharge members of said plurality of hydrocyclones for separating said tar, dust and salts from said concentrate stream.

4,036,607

METHOD AND RELEVANT APPARATUS TO CHECK THE ROTATION OF MECHANICAL WORKPIECES BEING MACHINED ON GRINDERS

Tomaso Freddi, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Continuation of Ser. No. 473,829, May 28, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,246
Claims priority, application Italy, May 25, 1973, 3412/73
Int. Cl.[2] B24B *49/04*
U.S. Cl. 51—165 R **10 Claims**



1. A method for checking the operation of a grinding machine for the machining of rotating mechanical workpieces, substantially of circular cross-section, comprising the steps of:

obtaining a measuring signal responsive to the workpiece size, this step being carried out both before and during the stock removing phases of the machining operation;

processing the measuring signals occurring at subsequent time intervals, said processing step including generating at least one variable signal responsive to the measurement of size variations of the workpiece both before and during the stock removing phases of the machining operation;

comparing the variable signal generated with a reference signal;

utilizing the result of the comparison for providing a signal indicative of the evenness of the rotation of the workpiece; and

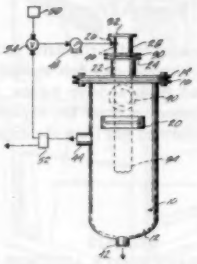
utilizing the latter signal as a conset for the prosecution of the machining depending on whether the workpiece rotates evenly.

4,036,608

METHOD AND APPARATUS FOR CONDENSING PYROLYSIS OILS

Richard M. Gundzik, Placentia, and Forrest E. Logan, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 11, 1975, Ser. No. 603,877
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—89 **10 Claims**



1. A method for separating pyrolysis oil and a hydrocarbon constituent in a vapor discharge stream from a flash pyrolysis process or a tar producing process comprising the steps of: mixing a high temperature heat transfer fluid with the discharge stream in an inlet pipe having an interior surface extending vertically from above the upper end of a vertically extending closed vessel into the interior of the vessel by directing the high temperature heat transfer fluid tangentially to the flow of the discharge stream in the inlet pipe and along the interior surface of said pipe; bubbling the resulting mixture through a body of liquid contained by the vessel and collected from the mixture discharged from the pipe to the vessel, withdrawing liquid containing primarily pyrolysis oil and high temperature heat transfer fluid from the surface of the contained liquid body, withdrawing heavier oil-solid condensates from the bottom of the contained liquid body, and exhausting the remaining vapor discharge stream from the vessel at a level above the contained liquid body.

4,036,609

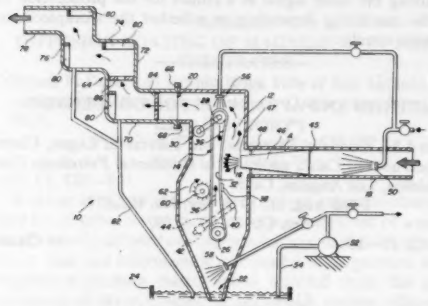
ENDLESS BELT IMPINGEMENT APPARATUS AND METHOD

Ladislav J. Pircon, 305 Canterbury Lane, Oak Brook, Ill. 60521

Continuation-in-part of Ser. No. 252,914, May 12, 1972, Pat. No. 3,920,422, which is a continuation-in-part of Ser. No. 190,248, Oct. 18, 1971, Pat. No. 3,853,506. This application Nov. 17, 1975, Ser. No. 632,648
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.[2] B01D *45/10*
U.S. Cl. 55—91 **17 Claims**

9. A process having a pressure drop of about 0.4 to 8 inches of water for removing particulate matter from gas streams comprising passing said gas stream having particulate matter therein through the entry of a nozzle; accelerating the gas stream through a converging portion of said nozzle having a mean angle of convergence of about 4° to 8° providing outlet velocities of about 2 to 12 times the entrance velocity; passing

said particulate-containing gas stream from the nozzle outlet through an expansion zone decelerating the gas, said acceleration and deceleration of the gas stream causing particulates to agglomerate; impinging said agglomerates and particulates upon an endless travelling belt of substantially imperforate



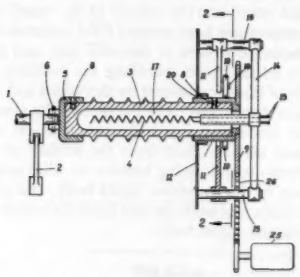
material thereby separating said particulates and agglomerates from said gas stream; driving said belt trained over an idler roller which is spaced from a drive means; removing said particulates and agglomerates from the expansion zone; and separately removing clarified gas from the expansion zone.

4,036,610

RAPPING SHAFT DRIVE ASSEMBLY FOR ELECTROSTATIC PRECIPITATORS

Xaver Johann Hüppi, Zurich, Switzerland, assignor to Elex A.G., Zurich, Switzerland

Filed May 23, 1975, Ser. No. 580,202
Int. Cl.[2] B03C *3/76*
U.S. Cl. 55—112 **3 Claims**



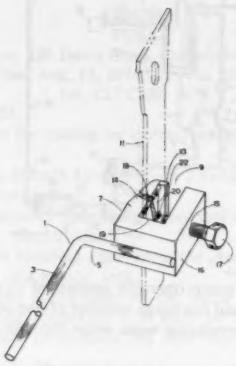
1. A rapping system for an electrostatic precipitator including a housing with a plurality of high voltage electrodes therein, said rapping system comprising: a rapping shaft with hammer means attached thereto operable to rap said electrodes while energized and a rapping shaft drive assembly, the housing having an opening in alignment with said rapping shaft drive assembly, said rapping shaft drive assembly including a rotatably mounted isolator connected to said rapping shaft at one end and a drive means at the opposite end; said isolator including heat means therein whereby dust accumulating on the outer periphery thereof is kept above a preselected temperature; and rotatable support means supporting the isolator, the support means including at least two support rollers including bearing means therein in communication only in points with said isolator such that heat transmitted from said heated isolator to said at least two rollers is minimized.

4,036,611

ELECTRODE HANGER ALIGNING DEVICE

Robert L. Bennett, Louisville; Orville C. Parrott, Fern Creek; Allan R. Getzin, and A. Ervin McClain, both of Louisville, all of Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 25, 1976, Ser. No. 670,270
Int. Cl.[2] B03C *3/86*
U.S. Cl. 55—149 **2 Claims**



1. In combination with an electrode hanger for an electrostatic precipitator, an electrode hanger aligning device comprising: a handle member and a hanger engaging member attached to said handle member, said hanger engaging member including means receiving said electrode hanger therein and means in said means receiving said electrode hanger aligning said electrode hanger, said hanger engaging member being of U-shaped cross-section, said hanger engaging member including an inwardly extending lip portion at the upper extremity of one leg of said hanger engaging member, the leg opposed to said one leg including said lip includes a threaded aperture therethrough; said means aligning said electrode hanger being a threaded adjusting member rotatably mounted within said threaded aperture in combination with a forming recess in said one leg including said lip, said forming recess receiving said adjusting member with said electrode hanger disposed therebetween.

4,036,612

APPARATUS FOR SEPARATING PARTICLES FROM A GAS STREAM

Friedrich-Wilhelm Guttmann, Bensberg-Refrath, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

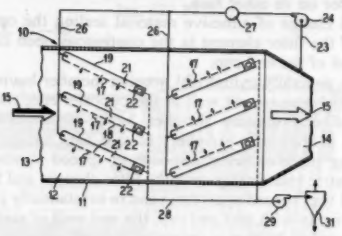
Filed May 17, 1976, Ser. No. 686,726
Claims priority, application Germany, May 17, 1975, 2522097
Int. Cl.[2] B01D *45/08*
U.S. Cl. 55—282 **4 Claims**

1. Apparatus for the separation of solid particles from a stream of gas comprising:

A. a housing having defined therein a chamber and having a gas input port defined in one end region thereof and a gas output port defined in an opposed end region thereof for passage of a gas stream longitudinally through said chamber,

B. a plurality of spaced, parallel deflecting plates located in said chamber so as to extend generally diagonally across said chamber transversely relative to the direction of flow of a said gas stream therethrough, the front face of each said deflecting plates being inclined to said gas input port and to said direction of flow,

C. wall members connected with each said deflecting plate to define a relatively shallow cavity over and about the rear face of each said deflecting plate said wall members further being connected with each said deflecting plate to define a transversely extending channel along the terminal edge portion of each deflecting plate relative to said direction of flow, the mouth of each channel being in generally parallel relationship to its adjacent said deflecting plate,



D. each said deflecting plate having a plurality of small gas flow apertures extending therethrough,

E. gas pressurizing means, gas pressure regulating means, and first conduit means interconnecting said gas pressurizing means and said gas pressure regulating means with each one of said cavities, and

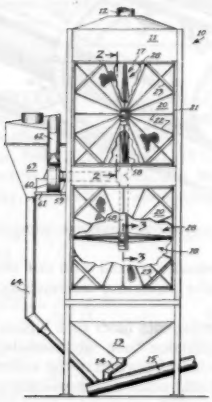
F. particle collection means and second conduit means interconnecting said particle collection means with an end region of each one of said channels.

4,036,613

ROTARY SWEEP ARM FOR SELF-CLEANING FILTER APPARATUS

William E. Brown, and Clyde M. Smith, both of Nashville, Tenn., assignors to Woods Metal Company, Inc., Nashville, Tenn.

Filed Aug. 25, 1976, Ser. No. 717,516
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—294 **9 Claims**



1. In a filter system including a housing having a gas inlet and a gas port which is covered by a screen member having an intake surface and an exhaust surface, a self-cleaning apparatus comprising:

a. a hollow sweep arm having an elongated radial intake slot,

b. exhaust means connected to said sweep arm for establishing a vacuum in said intake slot,

c. drive means mounting said sweep arm for rotary movement on the intake side of said screen member, said intake slot being closely adjacent said intake surface so that the vacuum in said slot cleans said intake surface as said arm sweeps over said intake surface and

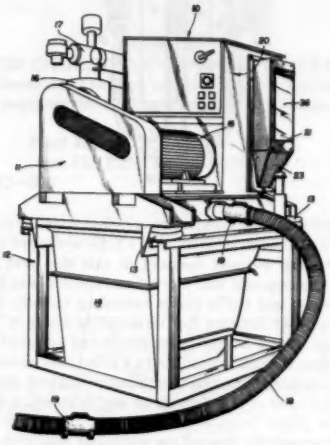
d. adjustable vane means in said intake slot for regulating the vacuum along the radial extent of said intake slot.

4,036,614

PRESSURE RELIEF MEANS FOR INDUSTRIAL VACUUM

Thomas M. DeMarco, Chicago, Ill., assignor to NFE International, Ltd., Arlington Heights, Ill.

Filed Mar. 21, 1975, Ser. No. 560,945
Int. Cl.[2] B01D *46/42*
U.S. Cl. 55—310 **6 Claims**



1. In an industrial vacuum unit having means for creating a flow of air and creating both a negative vacuum pressure and a positive pressure, pressure relief means comprising:

a housing mounted to said vacuum unit and having dividing means for partitioning said housing into a lower inlet chamber and an upper outlet chamber;

said vacuum unit having an opening and said inlet chamber having a first opening for receiving air from the vacuum unit through said opening and admitting same into said inlet chamber;

said dividing means having an opening for air flow between said inlet and outlet chambers;

said outlet chamber having outlet means providing an opening for releasing air from said housing;

movable sealing means mounted adjacent said outlet means; and,

support means mounted to said housing intermediate said outlet means and said movable sealing means and engageable with said movable sealingmeans to cover said outlet means for providing an air-tight seal of said outlet means for preventing the flow of air through said pressure relief means when said negative vacuum pressure exists in said industrial vacuum unit and for permitting movement of the sealing means away from thesupport means to allow the flow of air through the outlet means and the support means when positive pressure exists in said vacuum unit;

filter means mounted in said outlet chamber for removing particles from said flow of air passing through the housing; and

said inlet chamber having guide surface means extending below said filter means downwardly towards and in communication with said first opening for receiving said particles falling from the filter means and for downwardly directing these particles through said first opening and the

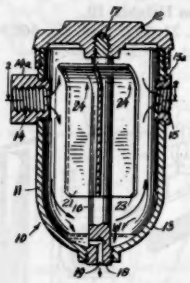
opening of said vacuum unit and thereby into said industrial vacuum unit.

4,036,615

MIST SEPARATOR

Leo Heintzelman, 4990 Burlingame, Wyoming, Mich. 49509

Filed Sept. 15, 1975, Ser. No. 613,494
Int. Cl.[2] B01D *45/08*
U.S. Cl. 55—442 **6 Claims**



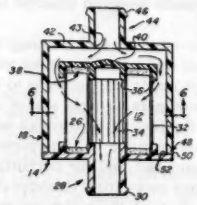
1. A mist separator comprising a cylindrical housing having a bottom and a cover so as to form a hollow-shaped vessel said housing having an inlet opening in one side and an outlet opening in an opposite side thereof and baffle plates positioned therebetween, said baffle plates extending radially across the diameter of said housing but terminating short of the walls thereof and axially from a point above and adjacent said inlet opening spaced from said cover to a point substantially below said inlet opening and spaced from said bottom and a water discharge nozzle in the bottom of said housing, a portion of said baffle plates extending above said inlet opening being curved downwardly toward the discharge nozzle to direct the flow of air downwardly, said bottom being closed except for said nozzle, and said nozzle being small relative to said inlet opening and being open to the atmosphere whereby a portion of the downwardly directed air acts to help expel the separated water through said water discharge nozzle.

4,036,616

BACTERIA FILTER AND METHOD OF ASSEMBLING SAME

John Byrns, Los Angeles, Calif., assignor to Robert A. Baker, Santa Barbara, Calif., a part interest

Filed May 1, 1974, Ser. No. 465,734
Int. Cl.[2] B01D *46/10*
U.S. Cl. 55—498 **6 Claims**



1. A filter device comprising in combination:

a base member substantially of circular disk configuration with a central opening therethrough, a pair of raised concentric circular rims surrounding said opening on one face of the base member defining a continuous open circular channel, a hollow tubular neck co-axial with said opening protruding away from the other face of the element defining an outlet passage of the filter device,

a generally cylindrical filter element with longitudinally extending pleats surrounding a hollow core of the filter element,

a first charge of adhesive material sealing one end of the filter element in the circular channel of the base member,

an end cap substantially of circular disk configuration overlying and covering the other end of said filter, said end cap further having a pair of raised concentric circular rims on one face thereof defining a raised continuous open circular channel, said end cap having a centrally located conical deflector on its other face,

a second charge of adhesive material sealing the opposite end of the filter element in the continuous open circular channel of the end cap,

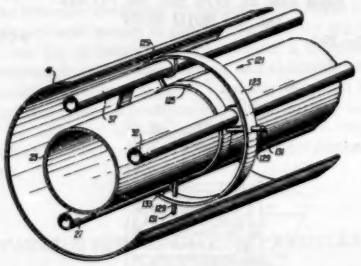
a hollow generally cylindrical housing member having one open end and an end wall at the opposite end, the open end of said housing member being circumferentially sealed to the outer periphery of said base member, said housing member being disposed in spaced surrounding concentric relationship with the filter element and having its end wall spaced apart from and in substantially parallel relationship with said end cap, the end wall of said housing member having a centrally located opening therethrough in axial alignment with the conical deflector on the end cap, and a hollow tubular neck co-axial with said opening in the end wall defining an inlet passage of the filter device whereby fluid flowing into the device through the inlet passage will be dispersed radially by the conical deflector on the end cap and thereby flow radially inwardly through the filter element before being emitted through the outlet passage in the base member.

4,036,617

SUPPORT SYSTEM FOR AN ELONGATED CRYOGENIC ENVELOPE

Kenneth R. Leonard, and James R. DeHaan, both of Boulder, Colo., assignors to Cryogenic Technology, Inc., Denver, Colo.

Filed Apr. 18, 1975, Ser. No. 569,481
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—55 **15 Claims**



1. An elongated cryogenic envelope comprising:

an inner tube;

an outer tube generally coaxial with said inner tube;

a refrigeration tube positioned intermediate said inner and outer tubes;

means for supporting said inner tube within said outer tube and said refrigeration tube intermediate said inner and outer tubes, at least a portion of the volume between said inner tube and said outer tube providing a vacuum chamber for holding a vacuum;

said means for supporting said inner tube within said outer tube including:

a high-thermal-conductivity ring surrounding said inner tube said ring being positioned intermediate said inner and outer tubes; and

a positioning means for positioning said ring intermediate said inner and outer tubes, said positioning means comprising at least one low-thermal-conductivity spoke extending between said surrounding ring and said outer tube; and

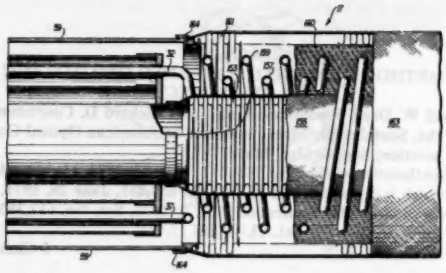
wherein said at least one refrigeration tube is supported by a radially extending portion of said ring.

4,036,618

FLEXIBLE CRYOGENIC ENVELOPE

Kenneth R. Leonard, and John D. Loudon, both of Boulder, Colo., assignors to Cryogenic Technology, Inc., Denver, Colo.

Filed Apr. 18, 1975, Ser. No. 569,498
Int. Cl.² F17C 7/02
U.S. Cl. 62—55 **17 Claims**



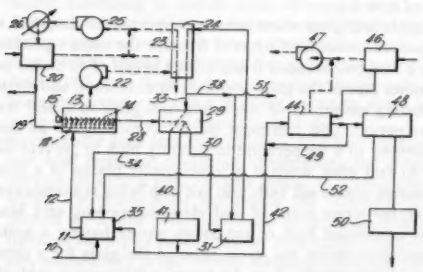
1. A flexible cryogenic envelope including:
a rigid portion comprising:
a rigid inner tube and a rigid outer tube generally coaxial with said rigid inner tube;
a means for holding said inner and outer tubes in positions spaced from one another;
a flexible portion comprising:
a flexible inner tube; a layer of reinforcing braid surrounding said inner flexible tube; an outer flexible tube generally coaxial with said inner tube; a layer of braid covering said outer flexible tube for protecting said outer flexible tube, at least a portion of the volume between the inner layer of braid and said outer flexible tube providing a vacuum chamber in said flexible envelope for holding a vacuum; and refrigeration means for directing refrigeration through said vacuum chamber in said flexible envelope; and
means for connecting said rigid portion to one end of said flexible portion.

4,036,619

FREEZER CONCENTRATION

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation, Houston, Tex.

Division of Ser. No. 320,592, Jan. 2, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,447
Claims priority, application United Kingdom, Jan. 5, 1972, 364/72
Int. Cl.² B01D 9/04; C02B 1/12
U.S. Cl. 62—123 **9 Claims**



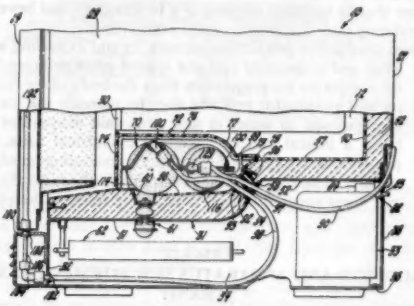
1. An apparatus for freeze concentration of a comestible liquid comprising a direct contact crystallizer, an indirect contact crystallizer, means for feeding the comestible liquid to the direct contact crystallizer whereby a slurry of ice and liquid is formed therein, means for feeding said liquid from the direct contact crystallizer to the indirect contact crystallizer whereby an ice-liquid slurry is formed therein, means to inject a cooling medium into the liquid when said comestible liquid is in the direct contact crystallizer to form said slurry of ice and liquid therein, and means for supplying a cooling medium to the indirect contact crystallizer for cooling said liquid in the indirect contact crystallizer to form said ice-liquid slurry therein.

4,036,620

WATER CHILLING TANK FOR REFRIGERATOR

Louis D. Benasutti, Fairborn, and Jost S. Sucro, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 4, 1976, Ser. No. 692,971
Int. Cl.² F25D 23/12; B67D 5/62
U.S. Cl. 62—338 **3 Claims**

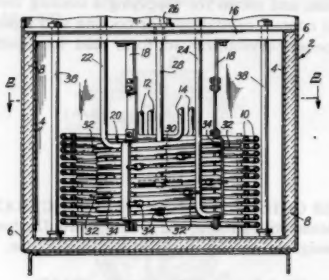


1. A water container for installation in an above-freezing portion of a refrigerator to cool water supplied to the container through a water valve connected between the container having first and second side-by-side elongated generally cylindrical sectioned water storage chambers formed by upper and lower half shells sealed together along a horizontally disposed seam which circumscribes the shells and includes one portion forming a medial seam, said first chamber having an inlet and said second chamber having an outlet, said inlet and said outlet both located adjacent the seam's one side edge, a crossover passage interconnecting said chambers at their closed ends, said cross-over passage formed with a generally semi-circular cross section in said upper half shell having its underside closed by a portion of said seam extending inwardly from said seam's second side edge, said first chamber, said crossover passage and said second chamber having cross sections which constantly increase in area from said first chamber inlet to said second chamber outlet, said seam having a portion of its one side edge offset upwardly a predetermined distance from the seam plane, an inlet tube connecting with said first chamber inlet, an outlet tube connecting with said outlet at a location substantially tangent with said second chamber's highest point of curvature, whereby water follows a U-shaped flow path upon entering said first chamber inlet at a point lower than said second chamber outlet, such that chilled water exits said second chamber outlet at said container's highest point obviating entrapment of air within said container, each of said first and second chambers formed with a plurality of baffle means whereby the water entering the inlet is made to change directions defining an undulating constantly diverging U-shaped flow path between the inlet and the oulet of said chambers.

4,036,621
BEVERAGE DISPENSERS

Paul F. Burton, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ranson, W. Va.

Filed Aug. 6, 1976, Ser. No. 712,214
Int. Cl.[2] F25D *17/02*; B67D *5/62*; F28F *1/10*
U.S. Cl. 62—394 3 Claims



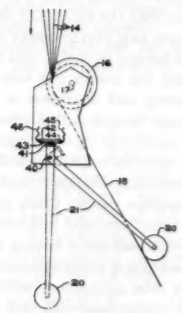
1. In a beverage dispenser and cooler having a cooling tank for holding a body of water, a beverage circulating coil in said tank and a refrigerant evaporator coil in said tank for freezing water therein to effect cooling of a beverage in said beverage circulating coil; the improvement comprising:

heat conductive projections secured to and extending away from said evaporator coil and spaced apart sufficiently to form separate ice projections from the body of ice formed on said evaporator coil and thereby increase the ice surface exposed to water in said tank, said evaporator coil being a helical coil of generally cylindrical form, said projections comprising metal rods extending generally radially of said evaporator coil, between the turns thereof, and being secured in heat conducting relation thereto.

4,036,622
METHOD AND APPARATUS FOR FORMING GLASS STRAND

Thomas D. Carroll, Shelby, and Christopher G. Cross, Forest City, both of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 4, 1976, Ser. No. 693,057
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—3 R 16 Claims

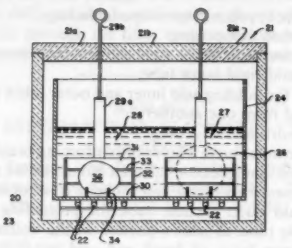


1. In a method of forming glass strand comprising attenuating glass filaments from molten glass contained in a bushing through orifices in the bushings, applying a binder and/or size to the filaments from an application surface of an applicator, gathering the filaments into a unified strand in a gathering shoe, traversing the strand across the face of a rotating spiral, and collecting the strand on a rotating collet, the improvement comprising: continuously contacting the strand with a strand detecting means, said means comprising a gravitationally activated pivoting rod means provided between the gathering shoe and the collet and independent of the gathering shoe, and automatically energizing a circuit means to deactivate the collet in response to a loss of contact of the detecting means with said strand.

4,036,623
METHOD OF MAKING HARDENED OPHTHALMIC LENSES BY ION EXCHANGE

Emil W. Deeg, Woodstock, Conn., and Richard D. Courtemanche, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 390,742, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 157,481, June 28, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 611,383
Int. Cl.[2] C03C *15/00*
U.S. Cl. 65—30 E 3 Claims



1. An ion replacement method for strengthening an ophthalmic crown type of glass wherein the oxide weight percent content of said glass consists essentially of oxides falling within the limits defined by the following table:

SiO_2: 60–75
Na_2O: 5–10
K_2O: 5–10
CaO: 7–15
LiO: 0–5
MgO: 0–2
ZnO: 2–8
Al_2O_3: 0–7
ZrO_2: 0–2
TiO_2: 0–2
Sb_2O_3: 0–2
CeO_2: 0–4.5
As_2O_3: 0–1.5

to enable said glass when suitably supported for drop-ball test purposes to withstand without fracture the impact produced by a $\frac{5}{8}$ steel ball dropped freely from a height of 50 inches onto the outer face of the glass near the center thereof, said method consisting essentially of subjecting said glass to a heat treatment period, said treatment period consisting of an initial preheating to a temperature sufficiently high to prevent damage to said glass when it is subsequently placed in a heated potassium nitrate salt bath, said salt bath being at a temperature above the strain point of said glass, submersing said heated glass in a liquid bath of potassium nitrate having a soaking temperature above the strain point of the glass for a time of from approximately 2 to 63 hours, withdrawing said glass article from said bath and lowering the temperature of the glass article.

4,036,624

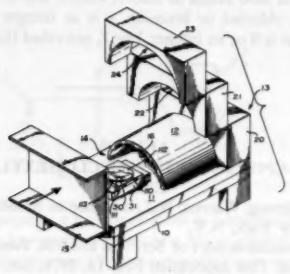
HEAT TREATMENT METHOD FOR MAKING PHOTOCHROMIC GRADIENT LENSES

David A. Krohn, Southbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 624,688, Oct. 22, 1975. This application Mar. 18, 1976, Ser. No. 668,175

Int. Cl.[2] C03C *15/00*; C03B *31/00*

U.S. Cl. 65—30 R 5 Claims



1. In a method of making ophthalmic quality lenses, or lens blanks, having a reversible, progressive, local variation in phototropic, or photochromic, behavior, said lens or lens blank including a portion ultimately to serve as a distance portion and another portion ultimately to serve as a near portion, the distance portion and near portion being contiguous with the near portion being below the distance portion when the lens is glazed in a frame, the reversible, progressive, local variation in phototropic or photochromic behavior being substantially more resistant to light transmission near the top which defines the upper limit of the distance portion thereof and substantially less resistant to light transmission in the near portion when said lens is glazed in a frame, the transition in light transmission from the top of the lens to the bottom being substantially uniform laterally of said lens when glazed,

comprised of an unnucleated oxide glass lens or lens blank, exhibiting no photochromic properties to the eye before nucleation, and being made of glass consisting of ophthalmic quality glass, said lens, or lens blank, containing through its volume at least 0.005 volume percent of at least one silver halide selected from the group consisting of silver chloride, silver bromide, silver iodide and mixtures thereof,

after nucleation in at least that portion of the lens, or lens blank, showing phototropic or photochromic behavior, said halide being in the form of particles, there being a progressive variation in the average linear dimension of said particles substantially corresponding to the variation in phototropic or photochromic behavior of the lens, or lens blank, the average linear dimensions of said silver halide particles being smaller than about 5 nanometers in the near portion and said particles substantially, progressively, increasing in size to about 50 nanometers in the distance portion, the improvement comprising the steps of

forming a lens, or lens blank, from a glass making batch, said lens, or lens blank, containing throughout its volume at least 0.005 vol. % of at least one silver halide selected from the group consisting of silver chloride, silver bromide, silver iodide, and mixtures thereof,

subjecting said glass lens, or lens blank, to a heat treatment, said heat treatment consisting of subjecting the distance portion of such a lens, or lens blank, to a temperature above the strain point but below the softening point thereof for a time period sufficient to grow silver halide particles having an average linear dimension of about 50 nm, substantially progressively lessening the temperature of heat treatment across said lens from the top edge which defines the upper limit of the distance portion to that area spaced therefrom which constitutes the near portion in such a manner as to form silver halide particles of progressively smaller average linear dimension to thereby produce a lens characterized by a local variation in phototropic or photochromic behavior

the greatest photochromic or phototropic behavior being exhibited in the distance portion.

4,036,625

METHOD OF AND FURNACE FOR BATCH CHARGING INTO A GLASS MELTING FURNACE

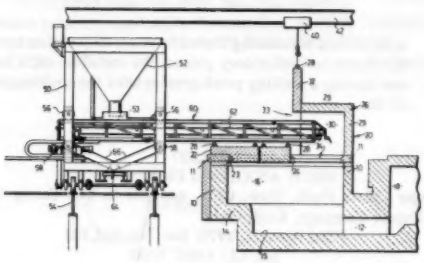
Charles Chamberlain Holmes, Birmingham; Wallace Skinner, Kingswinford, and George Roland Mattocks, Kidderminster, all of England, assignors to Elemelt Limited, London, England

Filed Apr. 8, 1976, Ser. No. 674,943

Claims priority, application United Kingdom, Apr. 8, 1975, 14308/75

Int. Cl.[2] C03B *3/00*

U.S. Cl. 65—134 22 Claims



1. A furnace for use in the melting of glass and comprising a furnace chamber for containing a body of molten glass, heating means for heating the body of molten glass, and outlet means through which molten glass is conducted from the chamber, wherein the furnace comprises

a. means defining an opening through which solid state glass batch material may be delivered into the furnace chamber, and

b. means for varying the area of the molten glass which is exposed for the reception of batch material.

18. A method of melting glass comprising

a. delivering solid state glass batch material onto the surface of a body of molten glass undergoing heating in a furnace chamber;

b. withdrawing molten glass from the chamber; and

c. controlling the area of the surface of the body of molten glass onto which glass batch material is delivered in accordance with the rate of withdrawal of molten glass from the chamber.

4,036,626

METALLIC SEAL FOR PREVENTING TIN LEAKS IN A FLOAT GLASS FURNACE

John S. Sieger, Glenshaw, and Joseph A. Gulotta, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 18, 1976, Ser. No. 687,568

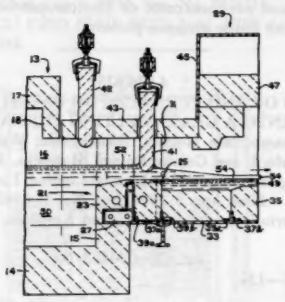
Int. Cl.[2] C03B *18/02*

U.S. Cl. 65—182 R 12 Claims

1. In an apparatus for forming flat glass comprising an enclosed chamber which includes a metal casing having a refractory liner disposed therein for containing a pool of molten metal consisting essentially of tin wherein the refractory liner comprises a plurality of refractory pieces having joints between adjacent pieces, which joints provide communication between the pool of molten metal and the casing, the improvement which comprises

metal seals located inside the casing in the vicinity of at least

some of the refractory liner joints, extending into the joints and contacting each refractory piece adjacent thereto for preventing the leakage of molten tin therethrough, said metal seals comprising metal which reacts



with molten tin causing the metal to swell pressing against the contacted refractory pieces, the metal of each metal seal having a melting point greater than the melting point of tin.

4,036,627
HIGH ANALYSIS FERTILIZER

Roger Calvin Funk, Stow, Ohio, assignor to The Davey Tree Expert Company, Kent, Ohio

Filed Nov. 21, 1975, Ser. No. 634,108
Int. Cl.[2] C05C 9/00
U.S. Cl. 71—29 **3 Claims**

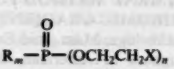
1. A dry high analysis fertilizer composition having the nutrients N, P and K comprising organic and inorganic nutrient components, said organic component being a powdered ureaformaldehyde blend, said ureaformaldehyde blend having generally water soluble and water insoluble nitrogen-releasing nutrient compounds, said water insoluble nitrogen-releasing compound being of a size to pass an 80-mesh sieve so that said water insoluble compound may pass through the nozzles of conventional fertilizer spraying and injecting equipment, said water insoluble compound being methylene urea and said water soluble compound being unreacted urea, the ratio of said water insoluble compound to said water soluble compound being approximately one to three parts of methylene urea to one part of unreacted urea, said inorganic component being monopotassium phosphate, said organic and inorganic components being mixed uniformly throughout the fertilizer composition in a ratio by weight of approximately 4:1 respectively, whereby the effective percentage of the nutrients N, P and K are present generally in the range of 29–31% for nitrogen, expressed as N, 9.7–10.3% phosphorus expressed as P_2O_5, and 6.8–7.2% soluble potash expressed as K_2O.

4,036,628
PHOSPHORUS CONTAINING HERBICIDE ANTIDOTES

Ferenc M. Pallos, Walnut Creek, and Don R. Baker, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 305,770, Nov. 13, 1972, abandoned. This application June 2, 1975, Ser. No. 582,944
Int. Cl.[2] A01N 9/36, 9/00, 9/12
U.S. Cl. 71—86 **18 Claims**

1. A herbicidal composition comprising an active herbicidal thiocarbamate compound selected from S-ethyl dipropyl thiocarbamate, S-ethyl diisobutyl thiocarbamate, S-propyl dipropyl thiocarbamate, S-2,3,3-trichloroallyl-diisopropyl thiocarbamate, S-ethyl cyclohexyl ethyl thiocarbamate, S-ethyl hexahydro-1H-azepine-1-carbothioate and S-4-chlorobenzyl diethyl thiocarbamate and an antidotally effective amount of an antidote compound corresponding to the formula



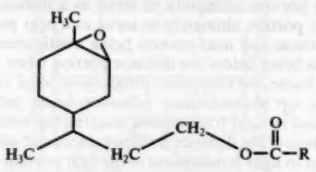
wherein R is lower alkoxy having from 1 to 6 carbon atoms, inclusive, haloalkyl having from 1 to 6 carbon atoms, inclusive, and wherein halo refers to fluoro, chloro and bromo substitutions, or haloalkoxy having from 1 to 6 carbon atoms, inclusive and wherein halo refers to fluoro, chloro and bromo substitutions, X is chlorine or bromine, n is an integer from 1 to 3, inclusive, m is 0 or an integer 1 or 2, provided that $n + m$ is 3.

4,036,629
3-(3,4-EPOXY-4-METHYLCYCLOHEXYL)BUTYL ESTERS

Jerry G. Strong, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 153,056, June 14, 1971, abandoned. This application Feb. 18, 1976, Ser. No. 659,079
Int. Cl.[2] A01N 9/28; C07D 303/16
U.S. Cl. 71—88 **10 Claims**

1. A compound having the formula:



wherein R is alkyl of 1–12 carbon atoms, or alky of 1–12 carbon atoms containing 1–3 substituents selected from the group consisting of halogen, alkoxy of 1–4 carbon atoms, and phenoxy.

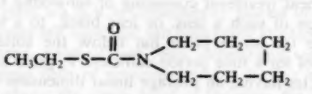
10. A plant growth regulant composition comprising a plant growth regulating amount of at least one compound of claim **1** and a carrier therefor.

4,036,630
SYNERGISTIC HERBICIDAL COMPOSITION FOR PADDY FIELDS

Teruhiko Toyama, Fujisawa, and Yoshio Takasawa, Chigasaki, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 290,002, Sept. 18, 1972, Pat. No. 4,001,004. This application Apr. 16, 1976, Ser. No. 677,534
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—88 **6 Claims**

1. A herbicidal composition for use in paddy fields consisting essentially of a herbicidally effective amount of a mixture of α-(β-naphthoxy)-propionanilide and a synergistic proportion of a compound having the general formula



and an inert carrier, the ratio of said α-(β-naphthoxy)-propionanilide to said compound being 1:1–4.

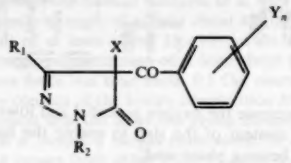
4,036,631

PYRAZOLONE DERIVATIVES AND THEIR USE AS HERBICIDES

Takuo Konotsune, and Katsuhiko Kawakubo, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

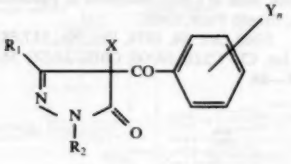
Filed Aug. 12, 1976, Ser. No. 713,900
Claims priority, application Japan, Sept. 23, 1975, 50-115344
Int. Cl.[2] A01N *9/22*; C07D *231/20*
U.S. Cl. 71—92 25 Claims

1. A compound having the formula



wherein R_1 represents a hydrogen atom or a lower alkyl group, R_2 represents a lower alkyl group or a lower alkenyl group, X represents a halogen atom, Y represents a halogen atom, a nitro group, a lower alkyl group or a lower alkoxy group, *n* is an integer of 1 to 3 and when *n* is 2 or 3, Y's may be the same or different.

19. A method for the destruction of undesirable weeds which comprises applying to said weeds a herbicidal amount of a compound having the formula



wherein R_1 represents a hydrogen atom or a lower alkyl group, R_2 represents a lower alkyl group or a lower alkenyl group, X represents a halogen atom, Y represents a halogen atom, a nitro group, a lower alkyl group or a lower alkoxy group, *n* is an integer of 1 to 3 and when *n* is 2 or 3, Y's may be the same or different.

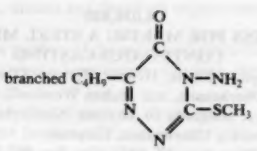
4,036,632

HERBICIDAL AGENTS

Kurt Westphal, Wuppertal-Vohwinkel; Werner Meiser, Wuppertal-Elberfeld; Ludwig Eue, Cologne-Stammheim, and Helmuth Hack, Cologne-Buchheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 526,663, Nov. 25, 1974, Pat. No. 3,966,715, which is a continuation of Ser. No. 120,713, March 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 6,647, Jan. 28, 1970, Pat. No. 3,671,523, which is a continuation-in-part of Ser. No. 630,225, April 12, 1967, Pat. No. 3,961,936. This application Jan. 19, 1976, Ser. No. 650,576
Claims priority, application Germany, Nov. 14, 1966, 1542873
The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—93 2 Claims

1. A method for selectively controlling weeds in growing tomatoes which comprises applying to the locus thereof a herbicidally effective amount of a 3-methylthio-4-amino-6-branched butyl-1,2,4-triaqine-5-one having the formula



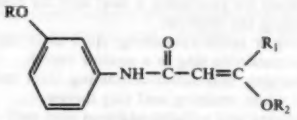
4,036,633

CROTONANILIDES

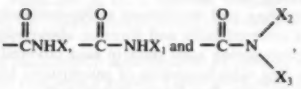
Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel-UCLAF, Paris, France

Filed Sept. 16, 1975, Ser. No. 613,911
Claims priority, application France, Oct. 3, 1974, 74.33320
Int. Cl.[2] C07C *103/60*; A01N *9/20*; C07C *125/06*
U.S. Cl. 71—106 23 Claims

1. A compound of the formula



wherein R is selected from the group consisting of



X is selected from the group consisting of alkyl of 1 to 8 carbon atoms and cycloalkyi of 3 to 7 carbon atoms, X_1 is alkoxyalkyl of 2 to 12 carbon atoms, X_2 is alkyl of 1 to 3 carbon atoms, X_3 is selected from the group consisting of alkyl of alkoxy of 1 to 3 carbon atoms, and R_1 and R_2 are individually alkyl of 1 to 3 carbon atoms.

16. A herbicidal composition comprising a herbicidally effective amount of at least one compound of claim **1** and a carrier.

4,036,634

OXIDATION AND SINTER-RESISTANT METAL POWDERS

Anthony V. Fraioli, Essex Fells, N.J., and John A. DeRosa, Queens Village, N.Y., assignors to Plessey, Incorporated, Melville, N.Y.

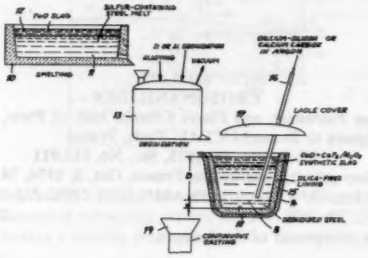
Division of Ser. No. 565,835, April 7, 1975, Pat. No. 3,966,463, which is a continuation-in-part of Ser. No. 496,714, Aug. 12, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 655,836
Int. Cl.[2] C22C *1/05*, *5/02*
U.S. Cl. 75—.5 A 1 Claim

1. A gold powder consisting essentially of gold and no more than about two percent of a coprecipitated oxide selected from the group consisting of titania and zirconia, in an amount sufficient to achieve a tap density greater than 6 and a sintering temperature higher than 600° C.

4,036,635
PROCESS FOR MAKING A STEEL MELT FOR CONTINUOUS CASTING

Wilhelm Klapdar, Essen; Helmut Richter, Oberhausen; Edgar Spetzler, Oberhausen, and Jochen Wendorff, Oberhausen, all of Germany, assignors to Thyssen Niederrhein AG Hutten- und Walzwerke, Oberhausen, Germany

Filed June 17, 1976, Ser. No. 697,225
Claims priority, application Germany, June 18, 1975, 2527156
Int. Cl.[2] C21C *7/06, 7/10*
U.S. Cl. 75—49 **11 Claims**



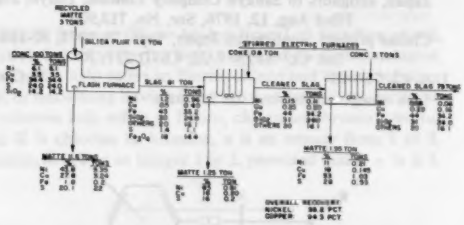
1. A process for producing a steel melt for continuous casting comprising the steps of:
   a. forming a sulfur-containing steel melt below an iron-oxide-containing slag in a smelter vessel;
   b. discharging said sulfur-containing steel melt from said vessel while retaining said slag therein;
   c. deoxidizing said sulfur-containing steel melt discharged in step b. from said vessel in a ladle by adding at least one substance selected from the group which consists of silicon and aluminum thereto to produce a deoxidized sulfur-containing steel melt;
   d. introducing said deoxidized sulfur-containing steel melt into a covered ladle and forming above said deoxidized sulfur-containing steel melt in said covered ladle a synthetic slag which consists of pulverulent lime and 10 to 30% of a silica-free fluxing agent; and
   e. blowing into said deoxidized sulfur-containing melt in said covered ladle at a depth of at least 2000 mm and about 300 mm above the bottom of said covered ladle in a neutral carrier gas a finely divided calcium-containing substance in a quantity in excess of a quantity of calcium required to stoichiometrically react with the sulfur of said deoxidized sulfur-containing melt, said covered ladle having a silica-free lining.

4,036,636
PYROMETALLURGICAL PROCESS FOR SMELTING NICKEL AND NICKEL-COPPER CONCENTRATES INCLUDING SLAG TREATMENT

Paul R. Ammann, Boxford, and Jonathan J. Kim, Chelmsford, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,896
The portion of the term of this patent subsequent to Dec. 31, 1991, has been disclaimed.
Int. Cl.[2] C22B *15/00*
U.S. Cl. 75—74 **17 Claims**

1. A process for extracting nickel values from a nickel bearing slag comprising the steps of:
   a. introducing the slag into a reactor;
   b. maintaining the temperature of the slag in the reactor at a level at which the slag is molten;
   c. adding a solid reductant to the slag in the reactor, the amount of reductant being sufficient to lower the oxygen potential of the slag to a level at which a nickel bearing phase separates from the slag;
   d. mixing the reductant into the slag in the reactor, while the slag is molten, with a liquid cooled, metal bladed, mechanical, rotating stirrer to reduce the slag, said stirrer being rotated at a speed sufficient to pump said reductant into the slag and keep it submerged in the slag long enough for

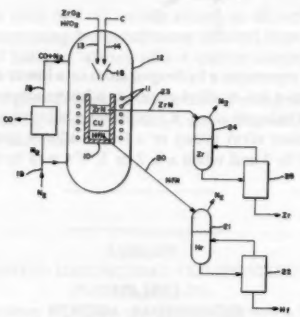


it to decrease the oxygen potential and lower the soluble nickel content of the slag to enable the formation of a nickel bearing phase; and,
   e. separating a nickel bearing phase from the slag.

4,036,637
SEPARATION OF ZIRCONIUM-HAFNIUM BY NITRIDE PRECIPITATION

Robert N. Anderson, Palo Alto, and Norman A. Parlee, Los Altos Hills, both of Calif., assignors to Parlee-Anderson Corporation, Menlo Park, Calif.

Filed Oct. 24, 1974, Ser. No. 517,581
Int. Cl.[2] C22B *34/00;* **C01G** *23/00, 56/00*
U.S. Cl. 75—84 **16 Claims**



1. In a method for the separation of a light metal reactive with nitrogen and a heavy metal reactive with nitrogen from a mixture containing the same metals, the steps of dissolving said mixture in a molten metal solvent which does not form a nitride under the conditions prevailing in the system, converting the light and heavy metals into nitride products insoluble in said solvent by maintaining a nitrogen-containing atmosphere over the molten metal solvent having a nitrogen partial pressure sufficient for said conversion, said molten solvent having a specific gravity sufficiently greater than said light metal nitride so that said last named nitride floats in a separate phase in the upper portion of said solvent, said metal solvent having a specific gravity sufficiently less than said heavy metal nitride so that said last named nitride sinks in a separate phase in the lower portion of said solvent, said metal solvent being present in sufficient quantity to form a liquid barrier separating said light and heavy metal nitrides into distinct phases.

4,036,638
BINARY AMORPHOUS ALLOYS OF IRON OR COBALT AND BORON

Ranjan Ray, Morristown, and Sheldon Kavesh, Whippany, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 631,752, Nov. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 590,532, June 26, 1975. This application Nov. 28, 1975, Ser. No. 636,323

Int. Cl.[2] C22C *38/00, 19/07*

U.S. Cl. 75—123 B **2 Claims**

1. A binary amorphous metal alloy that is about 100% amorphous having high mechanical hardness of at least about 1000 kg/mm^2, a tensile strength of at least about 470,000 psi and an elastic moduli of at least about 23×10^6 psi (in a saturating field), a saturation magnetization of at least about 10.8 kGauss and a coercive force less than about 0.1 Oe, characterized in that the alloy consists of the binary composition M_aB_b where M is one element selected from the group consisting of iron and cobalt, B is boron, *a* ranges from about 75 to 85 atom percent and *b* ranges from about 15 to 25 atom percent.

4,036,639
PRODUCTION OF COPPER

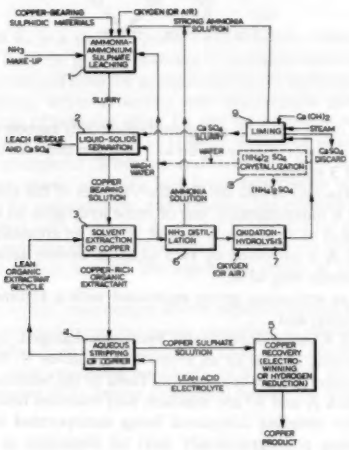
William J. Yurko, Edmonton, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation of Ser. No. 504,487, Sept. 10, 1974, abandoned. This application Sept. 7, 1976, Ser. No. 720,852

Claims priority, application Canada, Sept. 10, 1973, 180656

Int. Cl.[2] C22B *15/10*

U.S. Cl. 75—101 BE **7 Claims**



2. A process for recovering copper from cuprlferous sulphidic material comprising the following steps:

a. leaching the cupriferous sulphidic material under oxidizing conditions with an ammonium sulphate-containing ammoniacal aqueous leach medium to obtain a substantially iron-free copper-containing aqueous leach liquor and an insoluble residue;

b. separating the copper-containing aqueous leach liquor from the insoluble residue;

c. contacting the separated copper-containing aqueous leach liquor with an organic extractant for copper of the ionic exchange type having substantially greater affinity for copper ions than for other cations present in the aqeuous leach liquor to extract copper from the aqueous leach liquor, said organic extractant being dissolved in a substantially water-immiscible organic diluent;

d. separating the ammoniacal ammonium sulphate-containing aqueous leach liquor of reduced copper content from the organic diluent and dissolved copper-carrying organic extractant;

e. recycling a portion of the separated ammoniacal aqueous liquor containing ammonium sulphate directly to the leaching step;

f. recycling another portion of the separated aqueous leach liquor to the leaching step via an ammonium distillation step and a subsequent sulphate ion removal step, ammonia being distilled off from said other portion of the aqueous leach liquor during said ammonium distillation step and recycled to the leaching step, and said sulphate ion removal step removing an amount of sulphate ions from said other portion of the aqueous leach liquor about equivalent to the sulphur extracted from the cupriferous sulphate material during the leaching step;

g. contacting the organic diluent and dissolved copper-carrying organic extractant, thereby reconstituting the organic extractant and forming an acidic copper sulphate solution;

h. separating the organic diluent and reconstituted dissolved organic extractant from the acidic copper sulphate solution;

i. recycling the separated organic diluent and reconstituted dissolved organic extractant to copper extraction step (c);

j. recovering copper in elemental form from the acidic copper sulphate solution in a copper winning operation to produce elemental copper and sulphuric acid solution; and

k. recycling the sulphuric acid solution to copper stripping step (g).

4,036,640
ALLOY STEEL

Thoni V. Philip, and Gunvant N. Maniar, both of Reading, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Jan. 6, 1977, Ser. No. 757,250

Int. Cl.[2] C22C *38/22, 38/24, 38/26, 38/30*

U.S. Cl. 75—126 C **12 Claims**

1. An alloy steel, which is hardenable by heating up to about 2150° F while retaining a Snyder-Graff grain size of 9 or finer and tempered to a room temperature hardness of at least about R_c 60, which in its heat treated condition is substantially free of retained austenite, which by weight consists essentially of about

	w/o
Carbon	0.5–1.1
Manganese	0.10–<0.50
Silicon	0.10–<0.80
Chromium	3.5–5.0
Molybdenum	2.5–5.0
Vanadium	0.5–2.0
Cobalt	0.5–4.0
Columbium	0.15–0.50
Aluminum	up to 0.10

and the balance essentially iron and incidental impurities.

4,036,641
CAST IRON

Edward Raymond Evans, Birmingham, and John Victor Dawson, Stratford-upon-Avon, both of England, assignors to British Cast Iron Research Association, Birmingham, England

Filed Jan. 20, 1976, Ser. No. 650,774

Int. Cl.[2] C22C *33/08*

U.S. Cl. 75—130 A **13 Claims**

1. A method of treating molten carbon-containing iron to produce a cast iron with a compacted graphite structure comprising adding to the molten iron in a single step a quantity of an alloy containing silicon, magnesium, titanium and a rare earth, the balance being iron.

4,036,642

COPPER BASE ALLOY CONTAINING TITANIUM, ANTIMONY AND CHROMIUM

W. Gary Watson, Cheshire, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 19, 1976, Ser. No. 687,671
Int. Cl.[2] C22C 9/00; C21D 1/44
U.S. Cl. 75—164 **8 Claims**

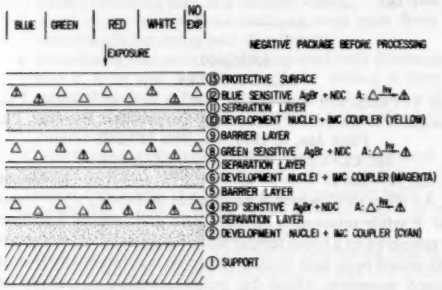
1. A high conductivity and high strength copper base alloy consisting essentially of 0.08 to 1.0% by weight titanium, 0.05 to 1.5% by weight antimony, 0.1 to 1.0% by weight chromium, balance copper, wherein the titanium and antimony are present at an atomic ratio of not more than 10% above 5 atoms of titanium per 3 atoms of antimony.

4,036,643

DIFFUSION TRANSFER COLOR PROCESS USING LACTONE OR SULTONE RING CONTAINING LIPOPHILIC NON-DIFFUSING COLOR FORMERS WHICH YIELD DIFFUSING DYES

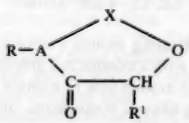
Felix Viro, Apalachin, and Michael C. Mourning, Vestal, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 368,976, June 11, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,128
Int. Cl.[2] G03C 7/00, 5/54, 1/40, 1/71
U.S. Cl. 96—29 D **14 Claims**



1. In a color diffusion transfer process carried out in a photographic film package having one or more color sensitive silver halide emulsion layers which respond to exposure by actinic radiation from different primary colors and which also contain color couplers yielding dyes of complementary colors to said different color sensitive layers, said film package being coated at a pH below 9, but preferably below pH 7, to provide a storage stable package in which color formers do not diffuse, and said package reacting with an alkaline aqueous processing and developing solution containing a p-phenylene diamine developer, the improvement comprising:

a. providing as the aforesaid color coupler a waterinsoluble, transient heterocyclic 2-equivalent color coupling compound having a lactone or sultone ring, said transient heterocyclic color coupling compound being resistant to splitting of said ring in alkaline aqueous solution in the absense of oxidative coupling; said transient heterocyclic color coupling compound being a compound of the formula:



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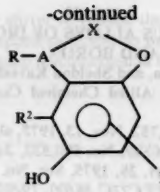
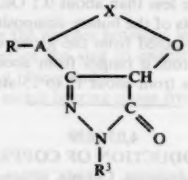
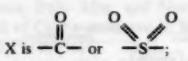


or



wherein



A is a chain of 1 to 3 atoms containing only carbon atoms in the chain or containing up to 1 nitrogen atom for chains of 2 or 3 atoms;

R is attached to and satisfies the valences of the atoms in A and is independently, one or more hydrogen, an aliphatic radical or an aromatic radical, or R is an aromatic radical and A is provided by two adjacent carbon atoms in an aromatic ring of R;

R^1 is an activating group associated with a ketomethylene coupler; and

R^2 and R^3 are independently hydrogen, halogen, cyano, an aliphatic radical or an aromatic radical, or R, R^2 and A together form a benzene ring fused to the benzene ring to which A and R^2 are attached; said transient heterocyclic color coupling compound being incorporated in a high boiling photographically inert oil dispersion to provide droplets having substantially no water solubility and no diffusion at pH below 9, yet being responsive to said alkaline processing and developing solution at pH above 9 to allow reaction of said transient heterocyclic color coupling compound with locally oxidized p-phenylene diamine and to thereby from imagewise water soluble and diffusible dye, the water solubility and diffusibility characteristics being bestowed upon the dye by a newly formed carboxylic or sulfonic acid group as a result of ring opening in coupling position by oxidative coupling reaction, said diffusible dye being free to diffuse out into a mordanted receiving sheet,

b. exposing said package in imagewise fashion and

c. after exposing developing said package in an alkaline processing solution having a pH above 9 and containing a p-phenylene diamine developer and in contiguous contact with said mordanted receiving sheet.

4,036,644

PHOTORESIST PROCESS AND PHOTOSENSITIVE O-QUINONE DIAZIDE ARTICLE WITH ALIPHATIC CARBOXYLIC ACID AS ADHESION PROMOTOR

Leon H. Kaplan, Yorktown Heights; John Baldwin Lounsbury, Pleasant Valley, both of N.Y., and Steven Michael Zimmerman, Totton, England, assignors to International Business Machines Corporation, Armonk, N.Y.

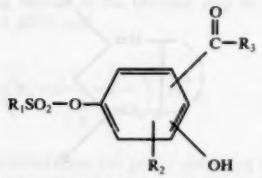
Continuation-in-part of Ser. No. 342,123, March 16, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,360

Int. Cl.[2] G03C 5/34, 1/60

U.S. Cl. 96—36 10 Claims

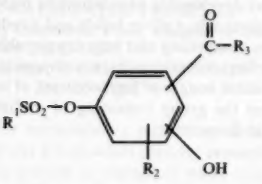
1. A process for forming a resist mask pattern on a silicon substrate having a surface coating selected from the group consisting of silicon oxide, phosphosilicate glass, sputtered quartz and metal comprising:

coating the surface coating with a layer of radiation sensitive polymer resist composition consisting essentially of a novolak resin and a diazo ketone sensitizer having the formula



in which R_1 is a naphthoquinone (1,2) diazide radical, R_2 is selected from the group consisting of hydrogen and hydroxyl, and R_3 is selected from the group consisting of hydrogen, alkyl, acyl, alkoxy, acyloxy, amino, and heterocyclic groups, in proportions of between about 1:1 and 1:6 weight of sensitizer to resin and from about 1 to 11% by weight of solids in the resist of an aliphatic carboxylic acid containing from about 3 to 30 carbon atoms, exposing said layer patternwise to actinic radiation for said sensitizer, and removing the exposed portions of said layer with a solvent developer for the actinic radiation exposed polymer resist composition to uncover the areas of the substrate surface beneath the exposed portions of the resist layer.

10. An article comprising a silicon substrate having a surface coating selected from the group consisting of silicon oxide, phosphosilicate glass, sputtered quartz and metal coated with a layer of resist consisting essentially of a novolak polymer, a light sensitive diazo ketone compound having the formula



in which R_1 is a naphthoquinone-1,2)-diazide radical, R_2 is selected from the group consisting of hydrogen and hydroxyl, and R_3 is selected from the group consisting of hydrogen, alkyl, acyl, alkoxy, acyloxy, amino, and heterocyclic groups, in proportions of between about 1:1 and 1:6 by weight of diazo ketone of novolak polymer, and from about 1 to 11% by weight based on resist solids of an aliphatic carboxylic acid containing from about 3 to 30 carbon atoms.

4,036,645

PHOTODETECTORS AND THIN FILM PHOTOVOLTAIC ARRAYS

Russell Stuart Pinder, and Leslie Clark, both of Newcastle-upon-Tyne, England, assignors to International Research and Development Company Limited, Newcastle-upon-Tyne, England

Filed Mar. 18, 1975, Ser. No. 559,483

Claims priority, application United Kingdom, Mar. 21, 1974, 12648/74

Int. Cl.[2] G03C 5/00

U.S. Cl. 136—89 C 13 Claims

1. In a method of forming a photo-voltaic hetero-junction in which at least one region of a semi-conducting material of a first conductivity type is treated through an opening in a resist layer to convert said at least one region into semiconducting material of a second conductivity type, the improvement which comprises the steps of:

i. coating a layer of semi-conducting material of the first conductivity type with a layer of photo-resist material applied directly to the semi-conducting material;

ii. exposing at least one area of the photo-resist layer to light by way of masking means;

iii. developing the photo-resist layer and removing the unexposed part of the layer to uncover at least one region of the said layer of semi-conducting material of the first conductivity type;

iv. introducing a chemical capable of converting the surface of the said at least one uncovered region into semi-conducting material of the second conductivity type to form a hetero-junction thereat; and

v. applying electrically-conducting material to the semi-conducting material of the second conductivity type to provide a contact to the hetero-junction.

4,036,646

COLOR CORRECTION OF UNWANTED SIDE DENSITIES IN LIGHT-SENSITIVE COLOR PHOTOGRAPHIC ELEMENTS

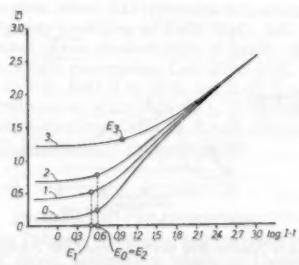
Ehrhard Hellmig, and Erwin Ranz, both of Leverkusen, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 4, 1975, Ser. No. 555,150

Claims priority, application Germany, Mar. 8, 1974, 2411105

Int. Cl.[2] G03C 7/00, 7/04, 3/00

U.S. Cl. 96—74 5 Claims



1. A light sensitive color photographic multilayer material having built-in means for color correction of unwanted side densities, essentially consisting of supported spectrally sensitive silver halide emulsion layers in superimposed relationship comprising a blue-sensitive silver halide emulsion layer with a colorless yellow-forming coupler, a green-sensitive silver halide emulsion layer with a colorless magenta-forming coupler and a red-sensitive silver halide emulsion layer with a colorless cyan-forming coupler, at least a first of said spectrally sensitive emulsion layers having a coupler providing an image dye produced by chromogenic development having a main density in the spectral sensitivity range of said first emulsion layer and

an unwanted side density in the spectral sensitivity range of a second of said spectrally sensitive emulsion layer and said second spectrally sensitive emulsion layer being partially fogged and developable to form on chromogenic development a dye of a color that compensates for the unwanted side density in said first emulsion layer, and a yellow filter layer wherein the improvement comprises said second spectrally sensitive emulsion layer has been fogged to a degree that produces on chromogenic development a color density of between 0.25 and 0.75 in the unexposed areas of said second emulsion layer and said second emulsion layer having in the fogged state a threshold photosensitivity not less than that in the unfogged state.

4,036,647

PACKAGE FOR MAKING PHOTOPOLYMERIZED PLATES

Robert G. Brault, Santa Monica; Cesar C. DeAnda, Santa Susana; Joe A. Jenney, Los Angeles, and John D. Margerum, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 13, 1972, Ser. No. 298,715
Int. Cl.[2] G03C *1/48*
U.S. Cl. 96—76 C **8 Claims**

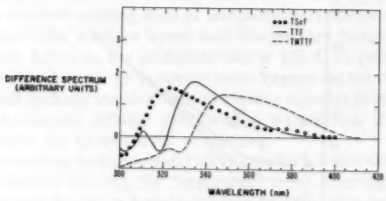
1. A new and improved method of storing components of photopolymerizable composition used in the recording of photopolymer images and photopolymer holograms wherein a monomer solution is separated from a photo-catalytic solution prior to the formation of said photopolymerizable composition comprising storing said monomer solution in a collapsible container separated from said catalytic solution which has been coated onto a substrate separated by spacers from a cover plate connected to said container by a fluid ingress means and a breakaway seal.

4,036,648

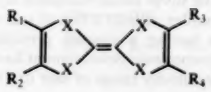
HIGHLY CONDUCTIVE PRINTING MEDIUM CONTAINING A HALOGENATED HYDROCARBON PHOTOACTIVATOR AND A TETRATHIAFULVALENE OR A RELATED COMPOUND THEREOF

Edward Martin Engler, Wappingers Falls; Frank Benjamin Kaufman, New York, and Bruce Albert Scott, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,992
Int. Cl.[2] G03C *1/52*; G03G *5/00*
U.S. Cl. 96—90 R **11 Claims**



1. A highly conductive printing medium comprising a substrate having disposed thereon a layer of an organic π-electron donor compound dissolved in a halocarbon capable in a complex with said organic π-electron donor compound of generating a free radical upon exposure to actinic radiation said medium being sensitive to actinic radiation, said organic π-electron donor compound having the emperical formula $C_6H_4X_4R_1R_2R_3R_4$ and the structural formula,



where X is selected from the group consisting of O, S, Se and Te and R_1, R_2, R_3, and R_4 is an organic substituent, selected from the group consisting of hydrogen, an alkyl group, halogen, CO_2Me, phenyl groups, substituted phenyl groups and fused cyclics and substituted fused cyclics selected from the groups consisting of cyclopentene, cyclohexene, benzene, furan, thiophene, dihydrofuran and dihydrothiophene.

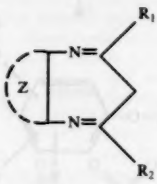
4,036,649

SILVER HALIDE EMULSION SENSITIZED WITH A FUSED DIAZEPINE

Henry John Schwalenstocker, Jr., Pittsford, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 17, 1976, Ser. No. 696,915
Int. Cl.[2] G03C *1/28*
U.S. Cl. 96—107 **9 Claims**

1. A photographic element comprising a support bearing a layer of a negative-working, developingout, silver halide emulsion containing a sensitizing amount of either a) at least one fused diazepine of the formula



wherein R_1 and R_2 may be the same or different and are selected from the group consisting of H, C_1–C_4 alkyl, and phenyl; and Z represents the non-metallic atoms necessary to complete an aromatic ring structure selected from the group consisting of benzene, pyridine, and naphthalene, which aromatic ring structure may contain halogen or lower alkyl groups as ring substituents; and b) a salt of said diazepine.

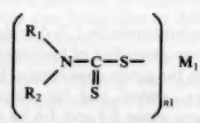
4,036,650

HEAT DEVELOPABLE PHOTOSENSITIVE MATERIAL CONTAINING COMPOUNDS OF SULFUR

Noriko Hasegawa, Tokyo; Hajime Kobayashi, Mitaka; Ichiro Endo, Yokohama, all of Japan, and Kikuo Kinjo, deceased, late of Tokyo, Japan (Kinjo, legal representative; by Ayako), assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 608,006
Claims priority, application Japan, Aug. 27, 1974, 49-98661; Aug. 27, 1974, 49-98662
Int. Cl.[2] G03C *1/02, 1/36, 1/34*
U.S. Cl. 96—114.1 **24 Claims**

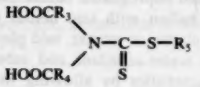
1. In a heat developable photosensitive material comprising an organic silver salt, a silver halide and a reducing agent, the improvement comprising said heat developable photosensitive material further containing, as a component for producing fogless and stable images of high contrast, at least one member selected from the group consisting of sulfur an sulfur compounds of the formulae:



(1)

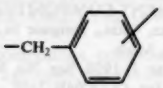
wherein R_1 and R_2 are similar or dissimilar and are selected from the group consisting of hydrogen, alkyl, alkanoyl,

phenyl, tolyl, xylyl, benzyl, and a heterocyclic group, M_1 is selected from the group consisting of a metal ion, an ammonium ion, an alkylammonium ion and a heterocyclic ion, and n_1 is determined depending upon the valency of M_1 and is an integer of 1-3;

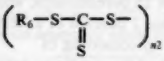


(2)

wherein R_3 and R_4 are similar or dissimilar and are selected from the group consisting of alkylene, phenylene, tolylene, dimethyl phenylene, and



where the methylene group is attached to the nitrogen atom and the floating radical in the benzene ring to the carboxyl group, and R_5 is alkyl; and



(3)

wherein R_6 is selected from the group consisting of hydrogen, alkyl, alkanoyl, phenyl, toyl, xylyl, benzyl and a heterocyclic group M_2 is selected from the group consisting of metal ion, an ammonium ion, an alkylammonium ion and a heterocyclic ion, and n_2 is determined depending upon the valency of M_2 and is an integer of 1-3.

4,036,651

ELECTROLESS COPPER PLATING BATH

Joel Alan Weiner, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,968

Int. Cl.[2] C23C *3/02*

U.S. Cl. 106—1 **4 Claims**

1. A bath for electrolessly depositing copper consisting essentially of a copper salt, a chelating agent for copper ion, sufficient alkali metal hydroxide or carbonate to maintain a pH of about 11-13.3, formaldehyde and sufficient sodium hypophosphite to appreciably increase the copper plating rate of the bath.

4,036,652

ENCAPSULATED PIGMENTS

Jules Rothmayer, Cincinnati, Ohio, assignor to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,418

Int. Cl.[2] C08K *9/10*

U.S. Cl. 106—308 N **5 Claims**

1. A process for encapsulating pigments which comprises the steps of (1) mixing a high solids pigment presscake containing about 40 to 50 percent by weight of water with ammonia and an ammonia-soluble acrylic resin to form a fluid mixture, (2) removing sufficient water from the mixture to form a kneadable mass, and (3) dispersing the mass under conditions of high shear to yield a finely-divided encapsulated pigment presscake, the amount of resin being about 10 to 40 parts by weight per 100 parts by weight of pigment presscake and the amount of ammonia being about 5 to 50 parts by weight per 100 parts by weight of pigment.

4,036,653

AMORPHOUS SILICON NITRIDE COMPOSITION CONTAINING CARBON, AND VAPOR PHASE PROCESS

Howard Wayne Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 28, 1975, Ser. No. 581,564

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.[2] C04B *35/58*; C23C *11/14*

U.S. Cl. 106—47 R **9 Claims**

1. An amorphous silicon nitride composition consisting essentially of from 95.0% to 99.9% by weight of amorphous silicon nitride, calculated as Si_3N_4 and based on the total weight of the composition, and from 0.1% to 5.0% by weight of carbon, calculated as elemental carbon and based on the total weight of the composition, the carbon being uniformly distributed within the silicon-nitrogen bonds in the amorphous silicon nitride.

4. Vapor phase process for preparing an amorphous silicon nitride composition according to claim **1** by the steps of (i) intimately contacting gaseous silicon tetrachloride ($SiCl_4$), gaseous ammonia (NH_3) and a gaseous hydrocarbon at a temperature from 1000°C. to 1500°C., hydrocarbon does not substantially decompose to form carbon prior to reaction of $SiCl_4$ and NH_3 to form silicons nitride (ii) condensing the products of the vapor phase reaction of step (i) and (iii) recovering the amorphous silicon nitride composition.

4,036,654

ALKALI-RESISTANT GLASS COMPOSITIONS

Brian Yale, Ormskirk, and Anup Sircar, Sheffield, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 426,142, Dec. 19, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,002

Claims priority, application United Kingdom, Dec. 19, 1972, 58613/72

Int. Cl.[2] C03C *3/04, 13/00*; C04B *31/06*

U.S. Cl. 106—52 **5 Claims**

1. An alkali-resistant glass composition consisting essentially of, in weight percentages:

SiO2	45 to 65%
ZrO2	6 to 20%
RO	20 to 45%

the total of SiO_2 + ZrO_2 + RO being not less than 94% by weight of the glass, where RO represents at least one divalent oxide of the group consisting of CaO, MgO, SrO, BaO and ZnO, the amount of said divalent oxide or oxides lying within the ranges, in weight percentages: CaO 20 to 45%, MgO 0 to 10%; SrO 0 to 8%; BaO 0 to 10% and ZnO 0 to 5% and wherein if components other than SiO_2, ZrO_2 and RO are included in said glass composition, each such component does not exceed 5% by weight of the composition.

4,036,655

INORGANIC COMPOSITION

Koichi Yamada; Tadanori Hashimoto, and Yoshinori Furumi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sept. 11, 1974, Ser. No. 504,964

Claims priority, application Japan, Sept. 14, 1973, 48-104061; Sept. 14, 1973, 48-104063

Int. Cl.[2] C04B *31/00*

U.S. Cl. 106—77 **8 Claims**

1. An inorganic composition which consists essentially of

A. 2 to 1,000 parts by weight of a calcined polyvalent metal-borate-type mixture obtained by calcining at a temperature of about 300°C to about 1,500°C a mixture comprising 100 parts by weight of (*i*) (*a*) a borate of a metal of Groups II to VIII of the Periodic Table or (*i*) (*b*) at least one boric

acid compound selected from the group consisting of boric acid compound selected from the group consisting of boric acid and boric oxide and at least one phosphoric acid compound selected from the group consisting of phosphoric acid, phosphorus pentoxide and a metal phosphate selected from the group consisting of sodium phosphate, potassium phosphate, and lithium phosphate and (ii) not more than 2,000 parts by weight of at least one polyvalent metal compound selected from the group consisting of polyvalent metal oxides, hydroxides, carbonates, phosphates, silicates, sulfates, and nitrates and

B. 100 parts (as solid matter) by weight of water-soluble silicates.

4,036,656

FOAMED MASTIC COMPOSITION, BUILDING ARTICLES COATED THEREWITH, AND METHOD OF PREPARING SAME

Mario P. Bucco, Annandale, and Alvin Van Valkenburg, McLean, both of Va., assignors to The Mearl Corporation, Ossining, N.Y.

Division of Ser. No. 3,528, Jan. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 560,940, Jan. 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 430,470, Jan. 4, 1965, abandoned. This application Aug. 29, 1975, Ser. No. 608,890

Int. Cl.[2] C04B *9/04*

U.S. Cl. 106—88 **7 Claims**

1. A method for the preparation and application of a foamed magnesia cement, which comprises:

a. pre-forming an aqueous foam by aerating a solution of a hydrolyzed animal protein foaming agent in water;

b. mixing magnesia, a magnesium salt selected from the group consisting of magnesium sulfate and magnesium chloride, and a foam stabilizing fire resistant filler in an aqueous slurry;

c. adding the pre-formed form to said slurry to provide a pumpable and sprayable foam cement, the foamed cement having a wet density in the range of about 8 to 30 pounds per cubic foot;

d. pumping the thus foamed cement to the point of application;

e. spraying the foamed cement upon a suitable substrate to form a layer thereon; and

f. air-drying said layer to convert the same to a foamed magnesia cement.

4,036,657

HIGH IRON OXIDE HYDRAULIC CEMENT

Povindar K. Mehta, El Cerrito, Calif., assignor to Reagents of the University of California, Oakland, Calif.

Filed July 23, 1975, Ser. No. 598,411

Int. Cl.[2] C04B *7/02, 7/04*

U.S. Cl. 106—89 **9 Claims**

1. High iron-oxide hydraulic cement compositions comprising from about 15 to about 65% by weight tetracalcium aluminoferrite, from about 10 to about 20% by weight tetracalcium trialuminosulfate, and from about 10 to about 15% by weight calcium sulfate.

4,036,658

PROCESS FOR THE PREPARATION OF AN IMPREGNATED BUILDING MATERIAL, AND THE PRODUCT THEREBY OBTAINED

Josef Alfred Pühringer, Taby; David Yngve Mikael Lund, Bromma; Rolf Bo Früberg, Jarna, and Erik Vilhelm Bernhard Örnelius, Bromma, all of Sweden, assignors to Nya Asfalt AB, Stockholm, Sweden

Filed Apr. 25, 1974, Ser. No. 464,208

Claims priority, application Sweden, May 4, 1973, 7300155

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **12 Claims**

1. A process for the preparation of plaster or mortar as a hydrofobous building material, wherein said plaster or mortar contains a ballast material and a binder, comprising impregnating the ballast material in a proportion of 5 to 90% by volume of said ballast material with a water repellant, said water repellant being a silane or a siloxane solution, a predominant part of the water repellant ballast material having a grain size of about 0.1 to 4 mms; drying said impregnated ballast material, admixing said impregnated ballast with said binder in an amount sufficient for forming plaster or mortar, said plaster or mortar possessing substantial water-repellant and substantial water vapor diffusion characteristics by allowing the material to reject water yet allowing the expelling of moisture from or through the incorporated plaster or mortar.

4,036,659

CEMENT COMPOSITION

Duane L. Stude, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1976, Ser. No. 662,666

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **19 Claims**

1. A cement composition comprising portland cement and the calcium sulfate hemihydrate form of gypsum in a weight ratio of from 3:1 to 1:3 and, based on the total weight of said portland cement and gypsum:

a. from about 5 to about 25 percent urea; and

b. from about 0.1 to about 2 percent of at least one retarder selected from the group consisting of

1. a water soluble salt of lignosulfonic acid,
2. a low molecular weight hydroxypolycarboxylic acid,
3. a sodium, potassium, or lithium salt of a low molecular weight hydroxypolycarboxylic acid, and
4. an alkaline hexametaphosphate.

4,036,660

METHODS OF USING CEMENTING COMPOSITIONS HAVING IMPROVED FLOW PROPERTIES, CONTAINING SULFONATED COPOLYMERS OF STYRENE-MALEIC ANHYDRIDE

Leonard J. Persinski, Pittsburgh, Pa.; Fred David Martin, Socorro, N. Mex., and Sally Lee Adams, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

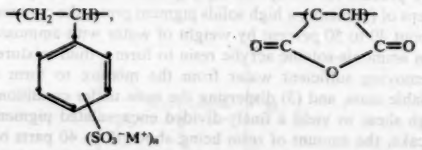
Continuation-in-part of Ser. No. 553,391, Feb. 27, 1975, Pat. No. 3,952,805. This application Apr. 14, 1976, Ser. No. 676,767

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.[2] C04B *7/35*

U.S. Cl. 106—90 **6 Claims**

1. In a method of subjecting an aqueous hydraulic cement slurry to flow for the purpose of handling or transporting said slurry, the improvement comprising adding to said slurry, prior to subjecting said slurry to flow, from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement on a dry basis, of a copolymer of randomly repeating units of the following formulas:



and

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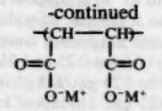


where M is hydrogen, ammonium or alkali metal ion, and n is an integer of 1 to 3.

4,036,661

ASPHALT MINERAL AGGREGATE COMPOSITIONS CONTAINING SILANES AS ADHESION PROMOTERS

Robert J. Schmidt, deceased, late of El Cerrito, Calif., and Peter E. Graf, Orinda, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 12, 1973, Ser. No. 331,424
Int. Cl.[2] C08L 95/00; C09D 3/24
U.S. Cl. 106—273 N 11 Claims

1. A surfacing composition comprising (A) 100 parts by weight of a mineral aggregate, (B) 3 to 20 parts by weight of an asphalt and (C) from 0.0001 to 0.10 parts by weight of a silane of the formula:

$$R^b - R^a - Si - X_3$$

wherein

1. X represents halogen or alkoxy,
2. R^a represents alkylene, and
3. R^b represents amino or aminoalkylene amino.

4,036,662

METAL ADDITIONS TO PIGMENTS OF PSEUDOBROOKITE-TITANIUM DIOXIDE STRUCTURE

Jacob Rademachers; Henning Erfurth, and Franz Hund, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 20, 1975, Ser. No. 624,214
Claims priority, application Germany, Oct. 26, 1974, 2451042
Int. Cl.[2] C09C 1/36, 1/22; C01G 23/00, 49/00
U.S. Cl. 106—300 16 Claims

1. A temperature-stable inorganic pigment of pseudo-brookite-titanium dioxide structure having the composition $Fe_2TiO_5 \cdot x\ TiO_2$, wherein x is from 0 to about 15, and containing about 0.1 to 10% by weight of the pigment of at least one metal selected from the group consisting of lithium, sodium, potassium, magnesium, zinc, calcium, aluminum, copper, vanadium, chromium, manganese, cobalt and nickel.

4,036,663

INORGANIC PIGMENTS AND METHODS FOR PRODUCING THE PIGMENTS AND AQUEOUS SLURRIES THEREOF

Lloyd E. Williams, Bel Air, and Guillermo A. Almagro, Aberdeen, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 198,020, Nov. 5, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,581
Int. Cl.[2] C08J 3/00; C08K 9/02; C09C 1/00; C08K 3/00
U.S. Cl. 106—308 B 4 Claims

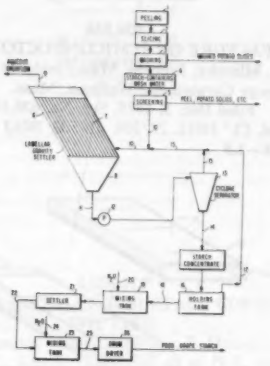
1. In a method for producing an aqueous dispersion of finely divided inorganic pigments in an aqueous medium to form aqueous dispersions thereof, the improved method comprising the steps of (1) intimately dry blending finely divided particulates of an inorganic pigment selected from the group consisting of hydrated silicas, calcium silicates, aluminum silicates, alumina, and sodium aluminosilicates, with from about 0.1 to 15.0 percent by weight based on the weight of said pigment of a soluble deliquescent salt selected from the group consisting of aluminum sulfate, aluminum nitrate, aluminum chloride, and aluminum acetate, to thereby form a substantially uniform solids mixture of said deliquescent salt in said pigment, and (2) dispersing said solids mixture into an aqueous medium to form a slurry of said mixture having a concentration on the order of about 10 to 50 weight percent of the solids mixture in the aqueous medium, said resulting dispersion being characterized by improved stability and remaining in uniform suspension over extended periods of time.

4,036,664

PROCESS FOR CONCENTRATING DILUTE AQUEOUS STARCH MIXTURES

William F. Priebe, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed May 2, 1975, Ser. No. 573,978
Int. Cl.[2] C13L 1/00
U.S. Cl. 127—69 15 Claims



1. A process for the concentration of finely-divided starch in an aqueous mixture having less than about 1 weight percent starch which comprises separating said aqueous mixture in a gravity settling zone into fractions of lesser and greater contents of starch solids, said fraction of greater starch content containing about 5 to 20 weight percent of starch solids and being of flowable and pumpable consistency, passing said fraction of about 5 to 20 weight percent of starch solids to a centrifugal separation zone, wherein fractions of greater and lesser starch solids content are separated, said fraction of greater starch content containing about 30 to 60 weight percent of starch solids and at least about 2 times the percent of starch solids in said fraction passed to said centrifugal separation zone.

4,036,665

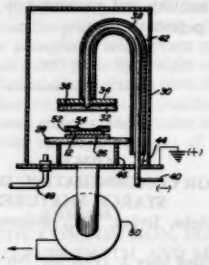
THERMOPILE FOR MICROWATT THERMOELECTRIC GENERATOR

Harold N. Barr; Warren Charles Lyon, both of Baltimore, and Thomas S. Bustard, Elicott City, all of Md., assignors to Nuclear Battery Corporation, Columbia, Md.

Filed July 16, 1974, Ser. No. 488,970
Int. Cl.[2] H01L 35/04, 35/16
U.S. Cl. 136—202 11 Claims

1. A thermopile assembly comprising a substrate and thin film thermopile means bonded to said substrate by sputtering,

said thermopile means including a plurality of semiconductor thermoelectric elements, said thermopile assembly having been



annealed at 250 to 450° C after said thermopile means is bonded to said substrate by sputtering.

4,036,666

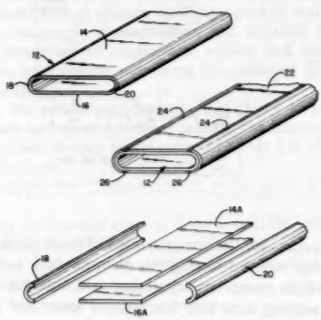
MANUFACTURE OF SEMICONDUCTOR RIBBON

Abraham I. Mlavsky, Lincoln, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Dec. 5, 1975, Ser. No. 638,187

Int. Cl.[2] H01L *21/208, 21/302;* B01J *17/18*

U.S. Cl. 148—1.5 **12 Claims**



1. A method of producing substantially monocrystalline ribbons for use in fabricating solid state electronic devices comprising the steps of:

a. providing a substantially monocrystalline body of a semiconductor material in the form of a flat oval tube having a pair of opposed mutually spaced substantially flat side wall sections connected together by a pair of opposed side edge sections; and

b. severing said opposed side edge sections from said tube so that said side wall sections are separated as discrete ribbons.

4,036,667

PROCESS FOR PRODUCING IMPROVED, PROTECTIVE CONVERSION COATINGS ON ALUMINUM AND ITS ALLOYS, WHEREIN ALUMINUM IS THE PRINCIPAL CONSTITUENT

Eli Simon, 7175 Little Harbor Drive, Huntington Beach, Calif. 92648

Filed June 16, 1976, Ser. No. 696,575

Int. Cl.[2] C23F *7/26*

U.S. Cl. 148—6.2 **1 Claim**

1. A method for imparting corrosion-resistant, tightly adherent, gold-colored, esthetically-appearing, chemically-bonded coatings to aluminum and its alloys, wherein aluminum is the principal constituent, by immersion of the metal substrate for 5 to 10 minutes at 65° to 85° F. in aqueous compositions consisting of: from 0.075 to 0.125 gm. of sodium nitroferricyanide dihydrate; a hexavalent chromium compound selected from the group consisting of from 0.75 to 1.25 gm. sodium dichromate dihydrate, 0.75 to 1.25 gm. anhydrous potassium dichromate, and 0.50 to 0.83 gm. chromium trioxide; an inorganic fluoride compound selected from the group consisting of 0.075 to 0.125 gm. potassium fluoride dihydrate, and 0.03 to 0.06 gm. anhydrous sodium fluoride; and 100 ml. of water with the solution adjusted to a pH of 1.4±0.3 with nitric acid, as required.

4,036,668

BONDING FLUOROELASTOMERS TO METAL

William D. Brandon, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 307,420, Nov. 17, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 558,765

Int. Cl.[2] C23C *11/12;* B32B *25/04*

U.S. Cl. 148—6.35 **8 Claims**

1. A method of bonding fluoroelastomers directly to metal without the use of a bonding agent between the fluoroelastomers and the metal while simultaneously curing the fluoroelastomers comprising pretreating a metal member by roughening a bonding surface thereof and then oxidizing the roughened bonding surface under oxidation conditions so controlled as to form an adherent oxide thereon; pressing a fluoroelastomer compounded with a minor amount of CaO evenly dispersed therethroughout directly to the adhered oxide covered bonding surface of the pretreated metal member without the use of a bonding agent other than said adherent oxide between said fluoroelastomer and said bonding surface; curing the fluoroelastomer-CaO dispersion at an elevated temperature in direct pressed contact with the adherent oxide covered bonding surface of the metal member and simultaneously forming a bond with said adhered oxide covered surface; and postcuring the resultant product to strengthen the bond.

4,036,669

MECHANICAL PRECONDITIONING METHOD

Greville B. Brook, Bucks, England; Peter L. Brooks, Palo Alto, and Roger F. Iles, Foster City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 18, 1975, Ser. No. 550,555

Int. Cl.[2] C22F *1/08*

U.S. Cl. 148—11.5 C **16 Claims**

1. A method for expanding the hysteresis loop of an article comprised of a metallic composition capable of undergoing a reversible transformation between austenitic and martensitic states wherein the A_s of the composition is elevated above its normal A_s, said method comprising deforming the article from an original configuration into a second deformed configuration from which heat recovery towards said original configuration is desired, applying constraining means to said article and holding the article in said deformed configuration at a temperature above the temperature M_d at which formation of martensite in the metallic composition is induced thermally in the absence of applied stress for a time sufficient to cause at least a portion of the deformation to be retained as heat recoverable strain, the recovery of which towards the original configuration begins above the normal A_s of the metal composition, when the constraining means is removed and removing said constraining means.

4,036,670

TOOL STEEL

Maurice P. De Walt, New Kensington, Pa., assignor to Continental Copper & Steel Industries, Inc., New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,953
Int. Cl.[2] C21D *7/14, 9/22*
U.S. Cl. 148—12.1 12 Claims

1. Process of heating steel substantially protected against attendant decarburization during such heating which comprises preliminarily cleaning and roughening the steel workpiece exterior, applying an adherent removable protective surface coating of metal material onto the exterior of the steel workpiece to be heated, carrying out such heating of the thereby protected steel workpiece, said heating including at least one hot working step, and thereafter removing the resultant metal material coating.

4,036,671

FLUX FOR THE SUBMERGED ARC WELDING OF ORDINARY, SEMI-ALLOYED OR SPECIAL STEELS

Robert Jean De Haeck, St. Pieters-Kapelle, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, S.A., Brussels, Belgium

Filed Apr. 13, 1976, Ser. No. 676,473
Claims priority, application Belgium, Apr. 14, 1975, 155372
Int. Cl.[2] B23K *35/34*
U.S. Cl. 148—24 8 Claims

1. Powdered flux for submerged arc welding, with a high efficiency level, of ordinary, semi-alloyed, alloyed or special steels, comprising:

A. about 40 to about 70% of (i) iron powder or (ii) one or more iron alloys or (iii) a mixture thereof, any alloying constituents comprising no greater than about 45% of ingredient (A);
B. about 10 to about 30% of CaF_2;
C. about 5 to about 15% CaO;
D. about 5 to about 14% of SiO_2;
E. about 0.2 to about 9% of Al_2O_3;
F. about 3 to about 10% of ZrO_2;
G. about 3 to about 12% of $MnOSiO_2$;
H. about 2 to about 7% of FeMn;
I. about 2 to about 7% of FeSi;
J. about 0.1 to about 1.3% of Fe_2O_3.FeO; and
K. 0 to about 0.3 wt. % of TiO_2; and wherein the ratio;

$$\frac{\%\ CaF_2 + \%\ CaO + \%\ MnOSiO_2}{\%\ SiO_2 + \%\ Al_2O_3 + \%\ Fe_2O_3\ FeO + \%\ TiO_2 + \%\ ZrO_2 + \%\ FeMn + \%\ FeSi} > 1.3.$$

4,036,672

METHOD OF MAKING A JUNCTION TYPE FIELD EFFECT TRANSISTOR

Sadao Kobayashi, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed May 5, 1976, Ser. No. 683,265
Claims priority, application Japan, May 14, 1975, 50-56109
Int. Cl.[2] H01L *21/74, 29/80*
U.S. Cl. 148—175 3 Claims

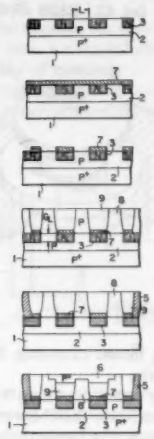
2. A method of manufacturing a vertical structure junction type field effect transistor comprising the steps of:

forming, in a semiconductor substrate of a first conductivity type forming a drain region, a gate region of a second conductivity type except the portion forming a channel portion;

forming a film masking the upper surface of said gate region, said film exhibiting the property of preventing the migration of impurity ions of the second conductivity type;

epitaxially growing a channel region of the first conductivity type on the upper side of said channel portion and simultaneously a polycrystalline silicon layer on said film; and

forming a source region in at least said epitaxial layer.

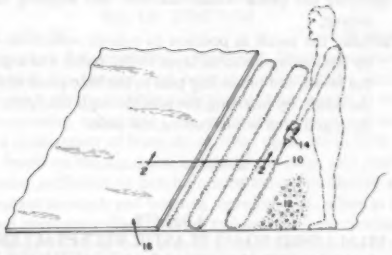


4,036,673

METHOD FOR INSTALLING SURFACE COVERING OR THE LIKE

Robert E. J. Murphy, Nutley; Laurence F. Haemer, Fairfield, and Edward C. Scholl, Tuckerton, all of N.J., assignors to Congoleum Corporation, Milwaukee, Wis.

Continuation of Ser. No. 429,187, Dec. 28, 1973, abandoned.
This application Mar. 18, 1976, Ser. No. 668,249
Int. Cl.[2] B32B *5/18*
U.S. Cl. 156—71 14 Claims



1. A method for installing a sheet of surface covering material on a floor surface comprising:

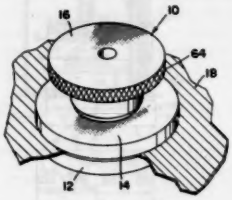
a. depositing a bead of a foamed latex-based adhesive to a portion of said floor surface,
b. laying said sheet on said foamed adhesive while said adhesive is wet,
c. applying pressure to said sheet for substantially completely collapsing the foam and spreading said adhesive to cover substantially the entire area of contact of said surface covering and said floor surface and thereby causing said adhesive to conform to any irregularities of said floor surface, and allowing said adhesive to dry, thereby uniformally bonding said sheet to said floor surface.

4,036,674

FABRIC REPAIR TOOL

James W. Labenz, 4426 Sheffield Ave., Philadelphia, Pa. 19136

Filed Dec. 31, 1975, Ser. No. 645,646
Int. Cl.[2] B32B *35/00*
U.S. Cl. 156—98 23 Claims



1. A fabric repair tool comprising
   a. a base plate;
   b. fabric holding means extending from the base plate to engage the fabric;
   c. hold down ring means overlying the fabric holding means to sandwich the fabric therebetween,
      1. said hold down ring means defining an opening;
   d. turning knob means insertable into the opening,
      1. said turning knob means comprising a cutter, the cutter cutting through a part of the fabric to remove a damaged area and to form a hole in the fabric when the turning knob means is inserted into the opening and
      2. a portion of said fabric holding means being adapted to engage the damaged area during the cutting.

18. The method of repairing a damaged fabric comprising the steps of
   holding the fabric at the damaged area by engaging the fabric between a base plate and a holding ring;
   cutting a hole of predetermined shape in the fabric to remove the damaged area without applying another substance;
   removing the fabric from contact with the base plate and holding ring;
   cutting an identical shaped patch in the fabric without applying a layer of another substance;
   applying the patch within the hole and aligning the fabric weave;
   affixing the patch in position to remain within the cut hole by laminating material layer to the patch and a portion of the fabric and providing pins in the base plate and holding the fabric by inserting the pins through the fabric near the damaged area while cutting the hole.

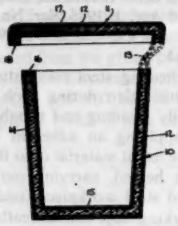
4,036,675

FILM-LINED FOAM PLASTIC RECEPTACLES AND LAMINATED MATERIALS AND METHODS FOR MAKING THE SAME

Stephen W. Amberg, Toledo, Ohio, and Frank S. Landers, Chicago, Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 482,321, June 24, 1974, Pat. No. 4,008,347. This application Apr. 2, 1976, Ser. No. 673,155
Int. Cl.[2] B29C *3/00*
U.S. Cl. 156—245 22 Claims

1. A method of laminating a polyolefin plastic film to a surface of a foamed plastic material comprising the steps of applying an initially wet coating of a heat-sensitive plastic resin adhesive on a surface of substantially unoriented polyolefin film and drying said coating, and thereafter heating said dried adhesive to a temperature above its softening point but below the softening points of said film and said foamed plastic material while holding said coated film surface and said foamed plastic material surface against each other, and thereafter cooling the laminated material to a temperature below said softening point of the adhesive.

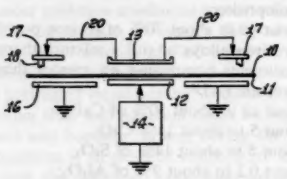


4,036,676

HEAT SEALING OF PLASTIC SHEETS

William Pennington, 30200 Oceanaire Drive, Palos Verdes Peninsula, Calif. 90274

Continuation of Ser. No. 565,234, April 14, 1975, abandoned, which is a division of Ser. No. 422,574, Dec. 6, 1973, Pat. No. 3,876,486. This application Aug. 23, 1976, Ser. No. 716,983
Int. Cl.[2] B29C *27/04;* H05B *9/04*
U.S. Cl. 156—273 3 Claims



1. The method of heat bonding plastic sheets that includes
   a. providing first and second pairs of relatively movable plates, providing flexible connections between the second of the first pair of plates to the second of the second pair of plates, placing the sheets between said plates of each pair, effecting relative closing movement of the plates of each pair and transmitting high frequency electrical energy from the first to the second of said first pair of plates in one direction through a first portion of said sheets of sufficient area as to preclude heat bonding of the sheets at said first portion thereof,
   b. transmitting said energy from the second of said first pair of plates through said flexible connections to the second of said second pair of plates, and
   c. transmitting said energy between said second pair of plates and back through a second and elongated portion of the sheets spaced from said first portion of the sheets and of sufficiently reduced area as to effect heating bonding of the sheets at said second portion.

4,036,677

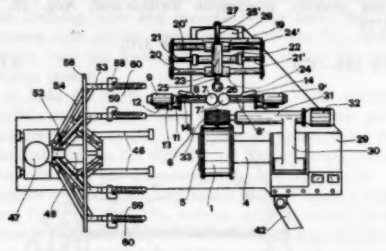
MACHINE FOR TREATING WORN OUT PNEUMATIC TIRES AND FOR APPLYING A PRE-MOLDED TREAD RING

Carlo Marangoni, Via Bellavista 22, Rovereto, Trento, Italy

Filed May 13, 1975, Ser. No. 577,111
Claims priority, application Italy, May 14, 1974, 22672/74
Int. Cl.[2] B29H *17/37, 17/38, 21/01, 21/08*
U.S. Cl. 156—394 1 Claim

1. A machine for retreading worn-out pneumatic tires comprising, in combination, a support; a chuck mounted on said support for rotation about an axis and operative for supporting

a tire to be retreaded thereon; means for inflating the tire on said chuck; means for selectively rotating the tire on said chuck about said axis; means for peeling the worn-out tread from the tire to obtain a tire carcass, including a cutting element mounted on said support for displacement toward and away from the tire in a path along a plane normal to said axis; means for preparing the peeled outer peripheral surface of the carcass for application of a new annular tread thereto, including at least one brush mounted on said support across said chuck from said peeling means for displacement toward and away from the carcass substantially along said plane; means for expanding the new annular tread and for positioning the same on the prepared outer peripheral surface of the carcass, including a plurality of expanding arms, means for mounting said expanding arms on said support axially of said chuck for simultaneous movement parallel to and radially of said axis, including rails located at one side of said plane and extending parallel to said axis, a carriage movable over said rails toward and away from said chuck, a cylindrical body mounted on said carriage and having a central axis coinciding with said axis, a sleeve mounted on said cylindrical body for axial displacement relative thereto, and first links articulated to said sleeve and to said expanding arms and forming a parallelogram linkage therewith, and means for sequentially moving said expanding arms



relative to said support between a retraced position in which said expanding arms are located axially adjacent said chuck and axially spaced therefrom and at a radial distance from one another at which the new annlar tread can be placed onto said expanding arms in unstressed condition, a fully expanded position in which the new annular tread is fully expanded and positioned over the outer peripheral surface of the carcass with spacing therefrom, and a partially expanded position in which the inner surface of the new annular tread contacts the outer peripheral surface of the carcass between said expanding arms and adheres thereto, the adhesion of the surfaces permitting the return of said expanding arms toward said retracted position without entrainment of the new annular tread, including a cylinder-and-piston unit accommodated in said cylindrical body and having a shank extending axially outwardly of the latter, a disc-shaped body connected to the shank, and second links pivoted on said disc-shaped body and on said first links; and means for pressing the new annular tread against the outer peripheral surface of the carcass, including at least one pressing roller mounted on said support at said peeling means for displacement between a retracted position outside said path and an extended position in which said pressing roller contacts the outer surface of the new annular tread and presses the same against the carcass.

4,036,678

LAP SEAM FOLDER AND WIDE WIDTH SEALER

Everette M. Lambert, 3380 Edward Ave., Santa Clara, Calif. 95050

Filed Apr. 21, 1975, Ser. No. 570,308
Int. Cl.[2] B65C 1/00
U.S. Cl. 156—461 **10 Claims**

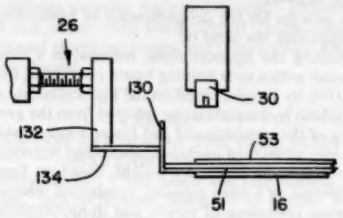
1. Apparatus for heat sealing first and second elongate pieces of material together, said apparatus comprising:

a working bed;

means for dispensing the first and second elongate pieces of material onto the working bed so that the second piece overlies the first piece with a marginal portion of the first piece being exposed;

means for folding the exposed marginal portion of said first piece of material over a corresponding marginal portion of said second piece of material;

means for heat sealing said material portions of the first and second pieces of material together; and



means for accumulating the heat sealed material, including means for transferring the accumulated heat sealed material to the dispensing means for dispensing said heat sealed material onto the working bed with the latter said means for joining said heat sealed material to another piece of elongate material so that an article can be formed having relatively large transverse dimensions from a plurality of such elongate pieces of material.

4,036,679

PROCESS FOR PRODUCING CONVOLUTED, FIBERIZED, CELLULOSE FIBERS AND SHEET PRODUCTS THEREFROM

Sangho E. Back, and Imants Reba, both of Vancouver, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Dec. 29, 1975, Ser. No. 644,472
Int. Cl.[2] D21C 9/00
U.S. Cl. 162—9 **22 Claims**

1. A process for producing convoluted, fiberized cellulose fibers which are twisted and bent in a substantially lasting manner, without appreciable reduction of fiber length or freeness, comprising subjecting low moisture content cellulose pulp at a consistency of from about 70%, up to about 90% by weight, based on the dry basis weight of the pulp, said consistency being sufficient to preclude substantial fibrillation and the attendant strength and bonding development, while at the same time preventing fiber damage and scorching, to mechanical treatment which gives rise to structural deformation of the fibers causing them to become convoluted and at the same time fiberizing and fluffing the pulp, the mechanical treatment including continuously feeding the pulp at a relatively high throug-put rate into and through a work space formed between opposed, spaced apart working elements to a point of discharge from the work space, the elements including opposed surfaces capable of engaging the pulp, the feeding step being conducted at a rate correlated with the rate of relative movement of the working elements and the spacing between the working surfaces so as to maintain the work space filled with a mass of fibers under sufficient compression so that the pulp is engaged by the working surfaces and contortive forces are imparted to the fibers which are effective to produce convoluted, fiberized fibers which are substantially nonfibrillated.

4,036,680

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH A SODA PULPING LIQUOR CONTAINING A DIELS ALDER ADDUCT OF BENZOQUINONE OR NAPHTHOQUINONE IN ADMIXTURE WITH A NITRO AROMATIC COMPOUND

Harry Hutchinson Holton, Beloeil, and Gordon Hart Segall, Mont St.Hilaire, both of Canada, assignors to Canadian Industries, Ltd., Montreal, Canada

Filed Dec. 14, 1976, Ser. No. 750,442
Int. Cl.[2] D21C *3/20, 9/10*
U.S. Cl. 162—65 8 Claims

1. A process for the delignification of lignocellulosic material comprising the steps of:

1. treating the lignocellulosic material in a closed reation vessel with a soda pulping liquor containing from 0.001 to 10.0% by weight, based on the lignocellulosic material, of a diketo hydroanthracene selected from the group consisting of the unsubstituted and lower alkyl-substituted Diels Alder adducts of naphthoquinone and benzoqunione, and from 0.01 to 10.0% by weight, based on lignocellulosic material, of a nitro aromatic compound selected from the group consisting of mono- and di-nitrobenzenes and the amino, carboxy, hydroxy and methyl derivatives of said nitrobenzenes, the treatment taking place at a temperature in the range of 150° to 200° C. for a period of 0.5 to 480 minutes, and
2. displacing the pulping liquor from the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain delignified lignocellulosic material.

4,036,681

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH AN ALKALINE PULPING LIQUOR CONTAINING A DIELS ALDER ADDUCT OF BENZOQUINONE OR NAPHTHOQUINONE

Harry Hutchinson Holton, Beloeil, Canada, assignor to Canadian Industries, Ltd., Montreal, Canada

Filed Dec. 14, 1976, Ser. No. 750,448
Int. Cl.[2] D21C *3/20, 9/10*
U.S. Cl. 162—65 10 Claims

1. A process for the delignification of lignocellulosic material comprising the steps of

2. treating the lignocellulosic material in a closed reaction vessel with an alkaline pulping liquor containing from 0.001 to 10.0% by weight, based on the lignocellulosic material, or a diketo hydroanthracene selected from the group consisting of the unsubstituted and lower alkyl substituted Diels Alder adducts of naphthoquinone and benzoquinone, the treatment taking place at a temperature in the range of from 150° to 200° C. for a period of 0.5 to 480 minutes, and
2. displacing the pulping liquor from the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain a delignified lignocellulosic material.

4,036,682

PAPER WITH SYNERGISTIC DRY STRENGTH ADDITIVES AND PROCESS THEREFOR

Lock-Lim Chan, Whitby, and Arthur Herbert Guitard, Pickering, both of Canada, assignors to Borden, Inc., Columbus, Ohio

Filed June 25, 1975, Ser. No. 590,314
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—167 18 Claims

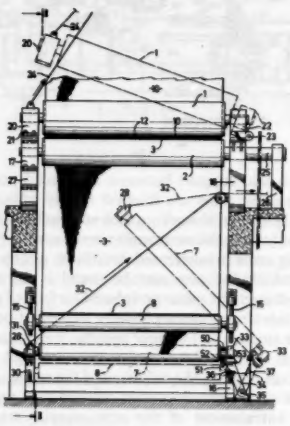
1. The process for the manufacture of paper of improved dry strength and negligible wet strength comprising forming an aqueous suspension of fibrous cellulosic material containing a cationic polymer prepared in an aqueous medium having pH of about 8 to 10 and an anionic polymer in the respective weight ratio of from 99:1 to 50:50 which is sufficient to impart synergistic dry strength to the paper, sheeting the cellulosic material to form a web and drying the web; the cationic polymer being a reaction product of a ketone, an aldehyde and a polyamine, the mol ratio of reactants being from 1.8 to 4 mols of the aldehyde and from 0.1 to 1 mol of the polyamine per mol of the ketone; the anionic polymer is selected from the group consisting of (a) polymers of acrylamide and maleic acid or derivatives thereof in respective mol ratio of from 90:10 to 98:2, (b) polymers of acrylamide or methacrylamide with acrylic or methacrylic acid in respective mol ratio of from 90:10 to 98:2, and (c) mixtures of the two polymers.

4,036,683

WEB PRESS FOR A PAPER MACHINE

Mario Biondetti, Schio, Italy, assignor to Escher Wyss G.m.b.H., Ravensburg, Germany

Filed Aug. 26, 1976, Ser. No. 718,084
Claims priority, application Switzerland, Aug. 28, 1975, 11140/75
Int. Cl.[2] D21F *3/02*
U.S. Cl. 162—274 3 Claims



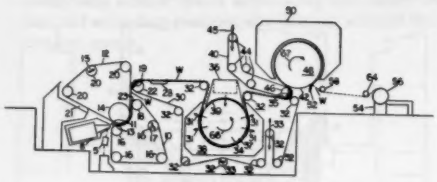
1. A web press for a paper machine comprising
a plurality of press rolls for pressing of an endless press felt thereagainst;
a plurality of guide rolls disposed below said press rolls to guide the felt in a downwardly directed loop, at least one of said guide rolls being located in the bottom region of the loop and being pivotally mounted about an axis adjacent one end thereof to pivot upwardly from an operative position;
a first bearing journalled on an end of said one guide roll opposite said one end;
a second bearing journalled on said one end;
means for releaseably mounting said first bearing with said one guide roll in said operative position;
a support mounting said second bearing thereon, said support being pivotal about said axis with said axis being horizontally disposed transverse to said one guide roll below said second bearing; and
an abutment for supporting said support beneath said second bearing.

4,036,684

HIGH BULK TISSUE FORMING AND DRYING APPARATUS

Arnold J. Schmitt, and Merle G. Linkletter, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 4, 1975, Ser. No. 601,521
Int. Cl.[2] D21F 5/04, 5/18
U.S. Cl. 162—290 4 Claims



1. In a papermaking machine for the manufacture of high bulk tissue web, having at least one forming wire, and web drying means comprising transpiration drying means which includes means supplying heated air and a foraminous surface through which the air is directed, the combination comprising:

a looped first fabric exposed in web receiving contact with the forming wire and arrayed (a) to carry the freshly formed web on the upper surface of the first fabric directly onto the foraminous surface of the transpiration drying means;

(b) to hold the web directly exposed to the foraminous surface so that the means supplying heated air passes it successively through the foraminous surface, the web, and the first fabric as the web is dried thereby; and (c) to carry the web from the transpiration drying means; and

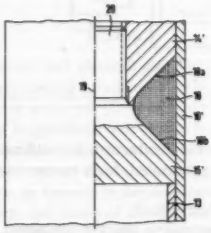
means for removing the web under positive control from the first fabric so that the web is carried during its entire passage from reception off the forming wire through the transpiration drying means and supported over, and in direct exposure with, the foraminous surface of the transpiration drying means.

4,036,685

METHOD AND APPARATUS FOR DETECTING THE LEAK OF COOLANT INTO THE JACKET OF A NUCLEAR REACTOR FUEL ROD

Helmut Betzmeir, Langensendelbach, and Hans Lettau, Baiersdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 27, 1972, Ser. No. 275,551
Claims priority, application Germany, July 28, 1971, 2137641
Int. Cl.[2] G21C 3/16
U.S. Cl. 176—19 LD 3 Claims



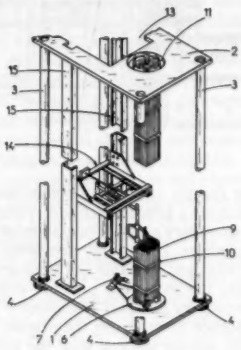
1. For use in a nuclear reactor incorporating water as the coolant thereof, a nuclear fuel rod including a nuclear fuel element and a jacket enclosing said element wherein the improvement comprises a coolant absorbing means mounted within said jacket for indicating the entry of coolant into said jacket; and means for mounting said absorbing means in an abutting relationship with respect to the inner wall of said jacket, at a predetermined location adjacent one end thereof; the combination being so constructed and arranged that upon entry of coolant into said jacket, said absorbing means expands radially of said jacket in response thereto to deform said jacket in a radial direction thereby indicating the presence of coolant therewithin, and wherein said absorbing means is made of a sintered material selected from the group consisting of magnesium oxide and a mixture of magnesium oxide and aluminum oxide, said absorbing means having a substantially cylindrical shape, with the side wall thereof abutting the inner wall of said jacket, for deriving pressure forces substantially directed radially against said jacket when absorption of coolant causes the expansion of said absorbing means, and wherein said absorbing means is ring-shaped.

4,036,686

APPARATUS FOR EXAMINING THE FUEL RODS OF A NUCLEAR REACTOR

Jean-Claude Weilbacher, L'Isle Adam; and Guy Bodson, Neuilly-sur-Seine, both of France, assignors to Societe Franco-Americaine de Constructions Atomiques-Framatome, Courbenvie; Bodson S. A., Nanterre, both of France

Filed Jan. 7, 1976, Ser. No. 647,167
Claims priority, application France, Jan. 22, 1975, 75.01924
Int. Cl.[2] G21C 17/08
U.S. Cl. 176—19 R 7 Claims



1. In an installation for use in examining the fuel rods in an assembly of fuel rods the improvement comprising:

a. an examination station adapted to be submerged including a lower plate and an upper plate fixedly spaced from said lower plate and further comprising:

a rotatable receptacle mounted on said lower plate for receiving a vertical assembly of rods to be examined, said rotatable receptacle being positionable in at least one of four orientations;

three movable carriages and respective means for moving said carriages, a first one of said carriages being movable on slides parallel to the rods of an assembly resting on the receptacle, a second one of said carriages being movable on horizontal slides carried by said first carriage, and a third one of said carriages being movable horizontally in a direction perpendicular to the direction of movement of said second carriage; and

an apparatus for examining fuel rods and for permitting the visual examination of the rods of a fuel assembly immersed in the tank of a nuclear reactor or in a deactivation tank, the apparatus comprising an endoscope having a first tube of relatively large diameter, said endoscope being provided with a prism and an optical system of stabilized glass, and at least one arm supporting at least one mirror facing the prism and inclined relative to the plane defined by the axes of the tube of said endoscope and of said arm, the thickness of the arm-mirror assembly being less than

the free space between the rods in the assembly to be examined, a support attached to said first tube, and a television camera attached to said support for recording images reflected by said optical system, said prism, and said mirror;

b. a service station adapted to be situated on an external platform and comprising:

a remote-control assembly for controlling movement of said three carriages and rotation of said receptacle; and

an observation station for observing images transmitted by said endoscope, the recorded images from said television camera being transmitted to said observation station.

4,036,687

NUCLEAR REACTORS

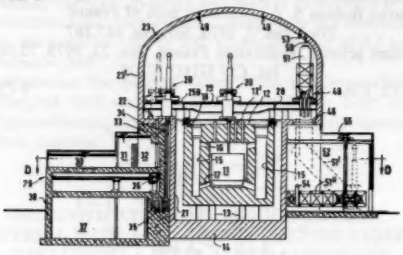
Allan Robert Rickard, Lutterworth, and Brian Victor George, Willoughby Waterleys, both of England, assignors to Nuclear Power Company Limited, London, England

Filed May 7, 1975, Ser. No. 575,342

Claims priority, application United Kingdom, May 10, 1974, 20907/74

Int. Cl.² G21C *19/20*

U.S. Cl. 176—37 **6 Claims**



1. A nuclear reactor installation comprising a fluid-cooled nuclear heat source, a primary pressure vessel containing the heat source, a secondary pressure containment vessel enclosing the primary pressure vessel and providing external-missile protection therefor, and a plurality of auxiliary-facility stations disposed outside the secondary pressure containment vessel, wherein the secondary pressure containment vessel comprises a lower wall portion surrounding the primary pressure vessel, an annular wall portion integral with the lower wall portion and extending outwardly therefrom. and an upper wall portion integral with the annular wall portion and extending over the annular wall portion and over the primary pressure vessel, the annular wall portion and the primary pressure vessel being formed with openable sealed vertical penetrations communicating with the respective auxiliary-facility stations and with the primary pressure-vessel interior respectively and handling means being provided, within the secondary pressure containment vessel and above the said annular wall portion and the primary pressure vessel, for lifting reactor components vertically through such penetrations and transporting them over the said annular wall portion and the primary pressure vessel.

4,036,688

APPARATUS FOR CONTROLLING MOLTEN CORE DEBRIS

Martin P. Golden, Trafford; Roger W. Tilbrook, Monroeville, and Neal F. Heylmun, Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 9, 1975, Ser. No. 566,489

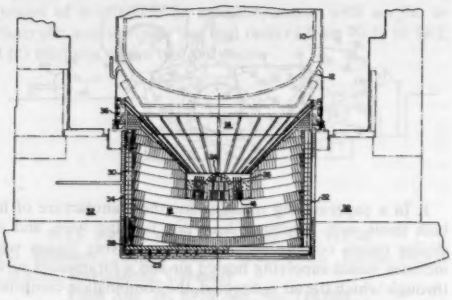
Int. Cl.² G21C *9/00*

U.S. Cl. 176—38 **9 Claims**

1. Apparatus for controlling molten debris from meltdown of a nuclear reactor core, said core being contained in a reactor vessel and including nuclear fuel, said vessel also containing a circulating liquid coolant, wherein said debris melts through the bottom of said reactor vessel causing said debris and said coolant to fall, said apparatus disposed below said vessel and comprising:

a. at least one debris receptacle comprising:

i. at least one generally spherical upwardly convex dome comprised of dome blocks which blocks are comprised of a high melting point material and at least some of which blocks have neutron poison rods therein;



ii. a plurality of bricks positioned radially about said dome comprised of a high melting point material, at least some of said bricks having neutron poison rods therein which extend above said bricks; and

iii. a layer of pellets positioned above said bricks and about at least a portion of the rods of said bricks, said pellets comprised of a material having a density at least equivalent to that of said molten fuel and being miscible with said molten fuel; and

b. means disposed below and radially about said bricks and pellets for supporting and controlling said dome, bricks and pellets.

4,036,689

MULTICHAMBER HYDROGEN GENERATING PLANT HEATED BY NUCLEAR REACTOR COOLING GAS

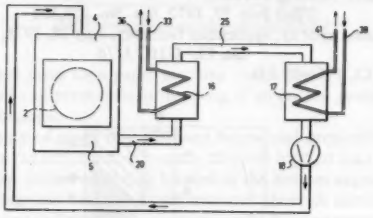
Heinrich Baumgaértner, Ketsch, Germany, assignor to Hochtemperatur-Reactorbau GmbH, Cologne, Germany

Filed Nov. 21, 1975, Ser. No. 634,053

Claims priority, application Germany, Nov. 23, 1974, 2455507

Int. Cl.² G21D *9/00*

U.S. Cl. 176—39 **15 Claims**



1. A plant for the production and utilization of heat energy derived from a gas-cooled, high-temperature nuclear reactor, comprising:

a. a thick-walled vessel;

b. a high temperature reactor contained in a centrally oriented cavity within said vessel;

c. a plurality of secondary reactors comprising cracking ovens for the production of hydrogen in first pods within the wall of said vessel;

d. a number of steam generators corresponding to the number of said secondary reactors, said generators being contained in second pods within the wall of said vessel;

e. a number of blowers corresponding to the number of said steam generators each of said blowers being contained in one of said second pods and being positioned beneath one of said steam generators;

f. conduit means for transporting hot cooling gas from said nuclear reactor to said secondary reactors and from said secondary reactors to said blowers; and

g. conduit means for transporting cooling gas of lower temperature from each of said blowers to said nuclear reactor comprising annular spaces surrounding said nuclear reactor, said secondary reactors, said blowers and said hot gas conduit means.

4,036,690

NUCLEAR REACTOR FUEL ELEMENT ASSEMBLIES

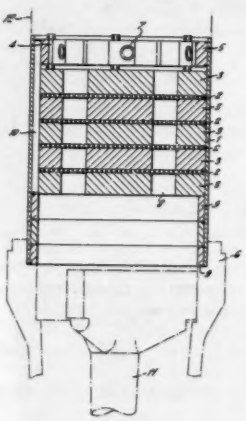
Colin Betts, Hale Altrincham; Alfred Edward Collinson, Padgate Warrington, and David Frederick Hart, Stretton Warrington, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 8, 1975, Ser. No. 638,669

Claims priority, application United Kingdom, Dec. 31, 1974, 56230/74

Int. Cl.[2] G21C *15/04*

U.S. Cl. 176—40 3 Claims



1. A nuclear reactor fuel element assembly having an axial flow cavitation suppressing impedance comprising a tubular body member and a series of flow defining plates arranged transversely to the longitudinal axis of the body member and clamped into face-to-face abutment, the series being formed from a first and a second set of plates arranged so that a plate of one set alternates, as viewed in the direction of flow, with a plate of the other set, the plates of the first set being of woven wire mesh and the plates of the second set having cylindrical apertures to provide downstream spaces between plates of the first set for defining a flow which is cavitation suppressed by virtue of eddy induced pressure drops developed in the downstream spaces, corresponding apertures in successive plates being aligned to provide continuous flow paths through the series of plates.

4,036,691

NUCLEAR FUEL ELEMENT

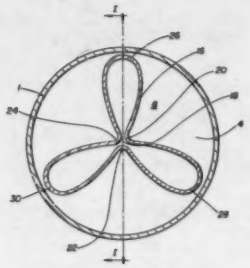
Ronald Ross Meadowcroft, and Alastair Stewart Bain, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 1, 1976, Ser. No. 662,857

Claims priority, application Canada, Dec. 3, 1975, 240961/75

Int. Cl.[2] G21C *3/04*

U.S. Cl. 176—68 1 Claim



1. A nuclear fuel element, comprising:

a. a tubular cladding of a material selected from the group consisting of zirconium and zirconium alloys,

b. end closures sealing the ends of the tubular cladding, the end closures being of a material selected from the group consisting of zirconium and zirconium alloys,

c. a plurality of cylindrical, nuclear fuel pellets in the tubular cladding and extending therealong, in end-to-end relation, to a fission gas plenum chamber in the tubular cladding and adjacent an end closure, the fuel pellets loosely fitting in the tubular cladding in a radial direction,

d. a heat resistant disc separating the cylindrical, nuclear fuel pellets from the plenum chamber and loosely fitting in the tubular cladding in a radial direction, and

e. a spacer in the plenum chamber and supporting the disc from falling into the plenum chamber, the spacer being of the shape of a tube, which has been deformed inwardly towards a radially central portion of the tubular cladding at a plurality of circumferentially spaced positions to provide a plurality of circumferentially spaced looped portions looping substantially radially outwardly from the radially central portion of the tubular cladding to positions adjacent the tubular cladding, the looped portions being substantially orthogonal to the tubular cladding, and the spacer being of a material selected from the group consisting of zirconium and zirconium alloys.

4,036,692

NUCLEAR FUEL ELEMENT NUT RETAINER CUP

Lewis Anthony Walton, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

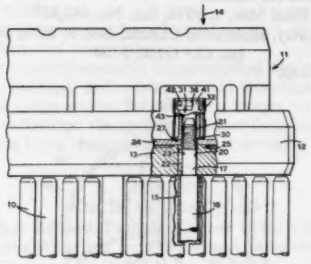
Filed Aug. 1, 1975, Ser. No. 601,000

Int. Cl.[2] G21C *3/30*; F16B *43/00*

U.S. Cl. 176—76 1 Claim

1. A nut plate for a nuclear reactor fuel element in which the fuel element has an array of end portions for engaging the nut plate comprising a plurality of linking members joined together to form a lattice of said linking members, nodes formed by said linking members where said linking members are joined together, at least some of said nodes having apertures formed therein, each of said apertures being positioned relative to the other of said nodes in a disposition that matches the fuel element end portion array, a plurality of hollow locking cups, each individual one of said cups being secured to said network of linking members at a respective one of said apertured nodes and in general alignment with said respective node aperture, a plurality of nuts, each individual one of said nuts being received within a respective one of said locking cups, for engagement between said individual nuts and at least some of the respective fuel element end portions and a flange formed on

said nut, and an ear formed on said locking cup protruding toward said nut and spaced from said nut flange to selectively engage said flange whereby said ear and flange combination



permits said nuts to be fully disengaged from the fuel element end portions but prevents said nuts from being fully withdrawn from said respective cups.

4,036,693

TREATMENT OF CELL CULTURE MICROCARRIES

David W. Levine, Somerville; William G. Thilly, Cambridge, and Daniel I. C. Wang, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 2, 1976, Ser. No. 654,134
Int. Cl.[2] C12B *3/00*
U.S. Cl. 195—1.8 **14 Claims**

1. In the method of growing anchorage-dependent cells in a suspension of positively charged microcarriers in culture medium:

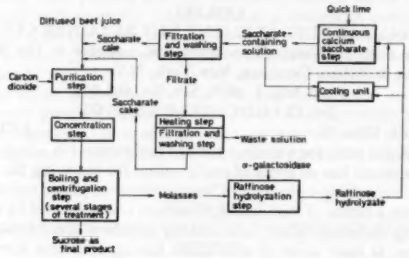
the improvement comprising treating said microcarriers by contacting them with a nontoxic macromolecular polyanion.

4,036,694

PROCESS FOR BEET SUGAR PRODUCTION

Shinichi Meguro, Tokyo; Shinsaku Imafuku; Kazuo Kawamura, both of Kitami; Shigeki Hashimoto, Tokyo, and Shigeyoshi Narita, Kitami, all of Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 616,133
Claims priority, application Japan, Sept. 28, 1974, 49-110991
Int. Cl.[2] C12B *1/00*; C13J *1/04*
U.S. Cl. 195—11 **6 Claims**



1. In a process for manufacturing beet sugar comprising purifying diffused beet juice, concentrating the purified beet juice, recovering sucrose from the concentrated beet juice in a boiling and centrifugal separation step, adding quicklime to the molasses remaining after the centrifugal separation of sucrose from the massecuite to produce calcium saccharate and returning the resultant saccharate cake to the diffused beet juice-purifying step, the improvement which comprises

a. adding α-galactosidase to the molasses remaining after the centrifugal separation of sucrose thereby hydrolyzing the raffinose present in the molasses into sucrose and galactose before said quicklime addition;

b. continuously adding quicklime to the resultant raffinose hydrolyzate to produce calcium saccharate;

c. continuously withdrawing from the calcium saccharate-forming step substantially the same amount of the saccharate-containing solution as the amount of raffinose hydrolyzate being fed into the calcium saccharate-forming step and forwarding the saccharate cake obtained by filtering and washing said saccharate-containing solution to the diffused beet juice-purifying step; and

d. at the same time, continuously withdrawing from the calcium saccharate-forming step a second volume of the saccharate-containing solution which is three to ten times the volume of the raffinose hydrolyzate being fed into the calcium saccharate-forming step, cooling said second withdrawn solution and returning the cooled solution to the calcium saccharate-forming step.

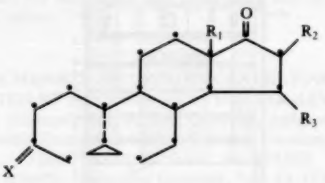
4,036,697

PROCESS FOR THE PREPARATION OF ESTRENE-3,17-DIONE DERIVATIVES

Karl Petzoldt, and Rudolf Wiechert, both of Darmstadt, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Nov. 19, 1975, Ser. No. 633,415
Claims priority, application Germany, Nov. 23, 1974, 2456068
Int. Cl.[2] C07B *29/02*
U.S. Cl. 195—51 B **11 Claims**

1. A process for the preparation of estrene-**3,17-dione** compounds of Formula I



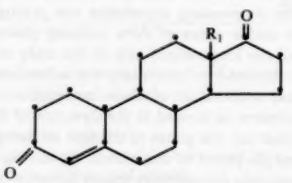
wherein X is keto or ketalized keto;

Δ is a carbon atom linked to the adjacent carbon atoms by a double bond and two single bonds;

R_1 is methyl or ethyl; and

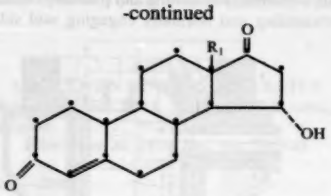
R_2 and R_3 collectively are a carbon-to-carbon bond or methylene which comprises

a. fermenting an **18-alkyl-4-estrene-3,17-dione** of the formula



wherein R_1 is as above with a fungal culture of the genus Penicillium or Fusarium to produce a **15α**-hydroxy steroid of the formula

-continued



wherein R_1 is as above;

b. in either order, ketalizing the **3-keto** group of the thus-produced **15α**-hydroxy steroid and forming a sulfonic acid ester of the α-hydroxy group thereof; and

c. either treating the ketalized and esterified compound (i) with a base to produce a Δ^{15} steroid of Formula I wherein R_2 and R_3 collectively are a carbon-to-carbon bond or (ii) with dimethylsulfoxonium methylide to form a **15β,16β**-methylene steroid of Formula I wherein R_2 and R_3 collectively are methylene.

4,036,696

PREPARATION OF ANTIBIOTICS BY FERMENTATION

Edward O. Stapley, Metuchen, N.J., and Justo M. Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 541,039, Jan. 14, 1975, abandoned, which is a continuation of Ser. No. 463,948, April 25, 1974, abandoned, which is a division of Ser. No. 331,417, Feb. 12, 1973, Pat. No. 3,914,157, which is a continuation-in-part of Ser. No. 19,496, March 13, 1070, abandoned, Ser. No. 51,319, June 30, 1970, abandoned, and Ser. No. 203,896, Dec. 1, 1971, abandoned.

This application June 14, 1976, Ser. No. 695,492

Int. Cl.[2] **C12D** *9/00*

U.S. Cl. 195—80 R **4 Claims**

1. The method for the preparation of 7β-(D-5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid which comprises growing in an aqueous nutrient medium under aerobic conditions an actinomycete capable of producing the desired product wherein the actinomycete is Streptomyces lactamdurans NRRL 3802.

4,036,697

KINETIC ASSAY FOR ALPHA-AMYLASE

Kenneth Jonas Pierre; Ker-Kong Tung, and Henriette Nadj, all of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 13, 1976, Ser. No. 657,976

Int. Cl.[2] **G01N** *33/00, 31/14*

U.S. Cl. 195—99 **37 Claims**

1. An alpha-amylase assay comprising:

a. performing simultaneous reactions which comprise:

I. reacting a polysaccharide having glucose molecules primarily connected through alpha 1,4 linkages in the presence of an alpha-amylase specimen to form alpha-maltose;

ii. reacting alpha-maltose with phosphate ions in the presence of maltose phosphorylase to form glucose and beta-D-glucose-1-phosphate;

iii. reacting beta-D-glucose-1-phosphate in the presence of beta-D-pgosphoglucomutase to form glucose-6-phosphate; and

iv. reacting glucose-6-phosphate in the presence of glucose-6-phosphate dehydrogenase and a co-enzyme selected from a group consisting of beta-nicotinamide-adenine dinucleotide, beta-nicotinamide-adenine-dinucleotide phosphate, and mixtures thereof to form the reduced form of said co-enzyme and 6-phosphogluconate; and

b. measuring the rate of production of said reduced co-enzyme,

wherein the alpha-amylase being measured is rate-limiting.

4,036,698

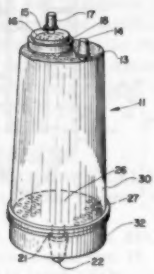
METHOD AND APPARATUS FOR MEMBRANE FILTER STERILITY TESTING

John H. Bush, Weston, Mass., and Jean Lemonnier, Le Vesinet, France, assignors to Millipore Corporation, Bedford, Mass.

Filed Nov. 6, 1974, Ser. No. 521,251

Int. Cl.[2] **C12K** *1/04, 1/10*

U.S. Cl. 195—103.5 M **7 Claims**



1. A method of testing for sterility of a liquid test material comprising the steps of:

first, providing an aliquot of said test material to each of first and second substantially identical canisters, each of said canisters having first and second ports in a first end thereof and a third port in the opposite end thereof and each of said canisters having a filter support member positioned within said canister parallel and spaced from said first end thereof and a second membrane filter supported on said filter support member, said second membrane filter facing said first canister end and sealed to the walls of said canister, said first port including a first membrane filter in it to provide that air flowing through said port has any microorganism above a predetermined size carried therein screened by said first filter, said first port being capped during said first step to provide a substantially hermetic seal and said second and third ports being opened to provide for passage of fluid through said canister whereby microorganisms in said test material are deposited on the second membrane filters within said canisters,

second, flushing each of said canisters with sterile solution with said ports in the same condition as during said first step to remove all of said test material from said second membrane filter, except for bacteria which has been trapped on said filters,

third, sealing said third port on the first one of said canisters while leaving said first port open and providing through said second port a known volume of a first microorganism growth medium;

fourth, sealing said third port of the second one of said canisters, while leaving said first port of said second of said canisters open and providing through said second port a known volume of a second mircoorganism growth medium, and

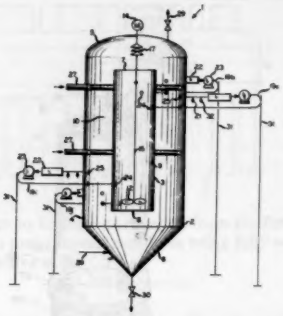
fifth, sealing all three of said ports to said canisters while maintaining the canisters in a specified range of temperatures for predetermined periods to allow bacterial growth in said first and second media, said media being formulated such that the growth of bacteria above a predetermined amount effects a visually measurable change in the appearance of the fluid within said canisters.

4,036,699

FERMENTATION APPARATUS AND METHOD

Donald J. Quigg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1976, Ser. No. 654,436
Int. Cl.[2] C12B 1/14
U.S. Cl. 195—142 **6 Claims**



1. A fermentation apparatus comprising:

a. a vessel having a chamber therein;

b. a draft tube mounted in said chamber and having flow openings adjacent opposite ends thereof, said draft tube defining a first flow path therethrough and defining a second flow path between same and portions of said vessel;

c. first flow inducing means in said vessel for inducing flow of fluid along said first and second flow paths;

d. a conduit having a major portion thereof positioned exteriorly of said vessel and having a first end opening into one of said first flow path and said second flow path and a second end opening into one of said first flow path and said second flow path forming a third flow path with said first and second ends being circumferentially spaced apart;

e. heat exchange means positioned exteriorly of the vessel and being in heat transfer relation with said conduit; and

f. second flow inducing means in communication with said conduit and being operable to induce flow therethrough.

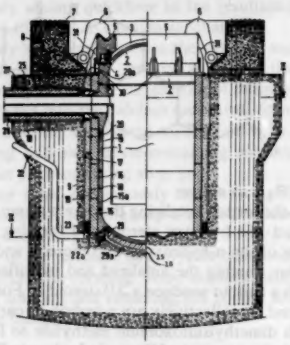
4,036,700

NUCLEAR REACTOR INSTALLATION

Heinrich Dorner; Axel Jungmann, and Manfred Scholz, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 8, 1974, Ser. No. 486,645
Claims priority, application Germany, July 9, 1973, 2334773
Int. Cl.[2] G21C 13/04
U.S. Cl. 176—87 **8 Claims**

1. A nuclear reactor installation comprising a metal pressure vessel having a vertical side wall, a reinforced-concrete wall surrounding said side wall and forming an annular space around said side wall, and a fluid-permeable layer of discrete particles surrounding said side wall and compacted in said space to transmit radial force from said side wall to said concrete wall, a thermally insulating and pressure-resistant encasement surrounding and normally engaging said side wall be-



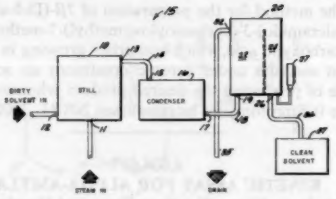
tween the latter and said layer, and means for flowing a fluid coolant through said layer.

4,036,701

STEAM DISTILLATION APPARATUS CONVERTIBLE TO TWO SEPARATE MODES OF OPERATION

Byron Jan Clay, 103 Kathy Drive, Brownsburg, Ind. 46112; Michael Lhotellier Wall, 1721 Shawnee Road, Indianapolis, Ind. 46260, and James Robert Cunningham, 117 E. South St., Lebanon, Ind. 46052

Continuation of Ser. No. 543,673, Jan. 24, 1975, abandoned. This application May 10, 1976, Ser. No. 684,904
Int. Cl.[2] B01D 3/02; B01J 1/00
U.S. Cl. 202—204 **10 Claims**



1. Distillation apparatus for purifying solvents which are immiscible with water comprising:

a. distillation apparatus for steam distilling solvents including:

1. a vaporizer having a steam inlet, a dirty solvent inlet and a vapor outlet, and

2. a condenser having an inlet connected to said vapor outlet, and having a liquid outlet for condensed liquids;

b. phase separation means connected to said liquid outlet, said phase separation means including:

1. a tank which has an inlet, a first outlet opening in the upper portion of said tank, a second outlet opening higher than said first outlet opening, and a third outlet opening higher than said second outlet opening, and

2. a coalescer within said tank and connected to said inlet whereby all of the liquids flowing into said tank are forced to pass through said coalescer.

c. first means for alternately permitting said first outlet opening to be connected to a plug means or for permitting said fist outlet opening to be connected to a tube extending to a point near the bottom of said tank; and

d. second means for alternately permitting said second outlet opening to be opened to a point near the upper portion of said tank or for permitting said second outlet opening to be connected to a tube extending within said tank to a point near the bottom of said tank, while said second

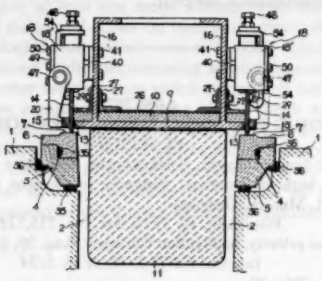
means is open to a point near the upper portion of said tank.

4,036,702

COKE OVEN SEALING APPARATUS

Konno Nagayoshi, No. 29-11, 3-chome, Takanodai, Nerima, Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,115
Int. Cl.[2] C10B *1/06, 25/06*
U.S. Cl. 202—248 8 Claims



1. In a coke oven sealing apparatus the combination of a door and door sealing frame wherein said door includes a base plate having an outer metallic door body and an inner adiabatic door plug connected to said base plate, said outer metallic door body having an outer adiabatic member, said base plate having a groove formed therein, a sealing means disposed in said groove, a knife edge seal fitted in said groove, a spring unit for adjusting said knife edge seal relative to said door frame, said door frame including an inner and outer frame member, and said knife edge seal having spaced U-shaped slots formed therein to add flexibility, and a holding means for holding said knife edge seal against said grooved base plate, the improvement comprising: a pair of projections located on either side of said U-shaped slots on the outer side of said knife edge seal, and a hooped shaped projection having a hole formed thereon on the outer side of said knife edge seal for reception of said holding means, said holding means including a pair of arms mounted to either side of said spring unit, a coil spring for biasing each of said arms toward said knife edge seal, said arms having an inwardly bent lower end to engage in the hole of said looped projection, said spring unit including a hook lever, said hook lever having a lower end hook for engaging said pair of projections on said knife edge seal, a first clamp means for the adjustable pressing of the inner frame member only against the coke oven, a second clamp means for adjustable pressing both the inner and outer frame member against the coke oven, and drawbars disposed on opposite sides of said door frame to draw said inner and outer frame members laterally.

4,036,703

METHOD OF SEPARATING CHLORINATED ALIPHATIC HYDROCARBONS WITH 1 TO 3 CARBON ATOMS FROM MIXTURES THEREOF BY EXTRACTIVE DISTILLATION

Jean-Claude Leroi, Villeurbanne, and Francois Vachet, Decines, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed June 17, 1976, Ser. No. 697,200
Claims priority, application France, June 25, 1975, 75.19892; Apr. 23, 1976, 76.12120
Int. Cl.[2] B01D *3/40;* C07C *17/38*
U.S. Cl. 203—57 13 Claims

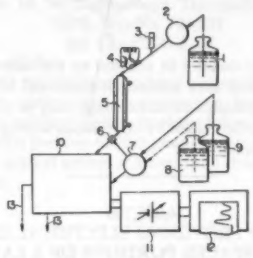
1. A method of at least partially separating chlorinated aliphatic C_1 to C_3 hydrocarbons from mixtures of at least two of the chlorinated hydrocarbons by extractive distillation, comprising subjecting the mixture of the chlorinated hydrocarbons to extractive distillation in contact with one or more organic third compounds having a boiling point higher than that of the substances to be separated, the extractive distillation being carried out at a temperature below the boiling point temperature for the third compound, in which the third compound is selected from the group consisting of methyl, ethyl, normal propyl and isopropyl mono and dichloroacetates; benzyl alcohol; salicylaldehyde, benzaldehyde, n-heptanal, methylisobutylketone, tetramethylurea, γ-butyrolacetone; normal propyl, isopropyl, normal, secondary and tertiary butyl acetylacetates; diethyl oxalate, dimethyl succinate and preferably methyl and ethyl acetylacetates; acetic anhydride, N-formylmorpholine, 2-chloro ethanol, hexamethylphosphotriamide, dimethyl sulphate and normal tributyl and triisobutyl phosphates, and recovering as overhead a separated distillate stream which contains a higher proportion of one of the chlorinated hydrocarbons then said mixture and a bottoms stream containing said third compound and a higher proportion of the other chlorinated hydrocarbons than said mixture.

4,036,704

LIQUID CHROMATOGRAPHICAL METHOD

Yoshinori Takata, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 27, 1973, Ser. No. 419,353
Claims priority, application Japan, Dec. 11, 1972, 47-123344
Int. Cl.[2] B01D *15/08;* G01N *27/42*
U.S. Cl. 204—1 T 5 Claims



1. A process for measuring the quantity of at least one electrolytically oxidizable component selected from the group consisting of S^{2-}, HS^-, SO_3^{2-}, HSO_3^{2-}, $S_2O_3^{2-}$, $S_2O_6^{2-}$, $S_3O_6^{2-}$, and $S_4O_6^{2-}$ and contained in an eluate solution obtained from a liquid chromatographic separation column, said process comprising mixing with said eluate solution a catalyst, comprising Cu^{2+} in a dilute acid solution effecting catalytic oxidation of said at least one electrolytically oxidizable component, and measuring the electric current produced by said catalytic oxidation.

4,036,705

METHOD FOR METAL EXCHANGE

Charles Douglas Eidschun, Jr., 11004 64th Terrace, North, Seminole, Fla. 33542

Continuation-in-part of Ser. No. 502,536, Sept. 3, 1974, abandoned. This application May 23, 1975, Ser. No. 580,304
Int. Cl.[2] C25D *5/02, 5/06*
U.S. Cl. 204—15 15 Claims

1. A method for exchanging metal on a workpiece, comprising the steps of:

positioning a pair of horizontally disposed counterrotating rollers each of which is covered with a material capable of absorbing a fluid,

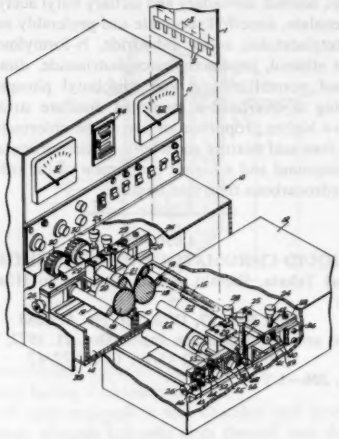
positioning the rollers in tangential wiping contact with a workpiece which is inserted vertically therebetween,

applying an electrolytic solution to said rollers from a location beneath the point of tangential contact,

fixedly jigging and holding the workpiece stationary between said horizontal rollers to fix an area of tangential

wiping metal exchange on the workpiece between the rollers,

further positioning and orienting the jig so that the workpiece is in a vertical plane passing between the rollers and positioning the point of metal exchange in an area substantially perpendicular to the mutual diameters of the rollers,



and timing the contact in relation to the concentration of fluid and work area contact proportional to the current whereby repeatable metal exchange may be achieved with a smooth surface aided by continuous wiping contact and fixed positioning.

4,036,706

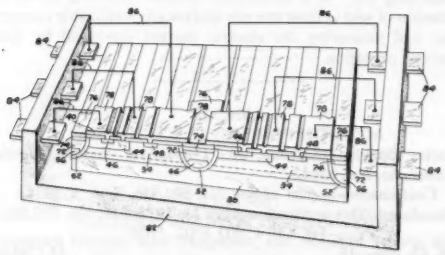
METHOD FOR PROVIDING ELECTRICAL ISOLATION BETWEEN SPACED PORTIONS OF A LAYER OF SEMICONDUCTIVE MATERIAL AND THE PRODUCT PRODUCED THEREBY

Raymond E. Scherrer, West Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 25, 1976, Ser. No. 670,498

Int. Cl.[2] C25D *5/02, 7/12, 5/48*

U.S. Cl. 204—15 **10 Claims**



1. A method for providing electrical isolation in semiconductive material while maintaining a planar surface, comprising the steps of:

removing the semiconductive material from regions of a planar surface in which isolation is desired to form an isolation moat;

forming a dielectric layer on the surfaces of the semiconductive material defining the moat;

depositing a metal over the semiconductive material so that the metal covers the planar surface of the semiconductive material and only a portion of the surfaces defining the isolation moat;

forming a protective layer over the metal deposited in the isolation moat;

selectively removing the metal deposited on the planar surface of the semiconductive material using an etchant that attacks said metal but has little or no effect on the protective layer; and

selectively plating metal into the isolation moat to substantially fill said moat and provide a planar surface with the semiconductive material.

4,036,707

METHOD FOR METALLIZING THERMOSETTING PLASTICS

Herbert Januschkowetz, Neukatzwang, and Hans Laub, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,722

Claims priority, application Germany, Aug. 29, 1975, 2538571

Int. Cl.[2] C25D *5/10, 5/56, 5/54*

U.S. Cl. 204—20 **14 Claims**

1. A method for metallizing a thermosetting resin comprising:

a. etching the surface of said resin with an oxidizing acid;

b. activating the surface of said resin with a stannous chloride solution;

c. sensitizing said resin in an aqueous solution of from 0.1 to 0.5 g per liter of palladium chloride and 1 to 6 ml of concentrated hydrochloric acid per liter;

d. immersing said resin at about 90° C in an accelerator bath having a pH of about 7, said bath containing sodium hypophosphite, trisodium citrate, ammonium chloride and 2,4-dihydroxy benzoic acid;

e. electrolessly nickel-plating said resin at a temperature of between about 96° to 99° C in a fast-depositing nickel bath having a pH of about 6.5 to 6.9 to form a nickel layer;

f. electroplating said nickel layer with copper; and

g. metallizing said copper layer to form a metallized layer.

4,036,708

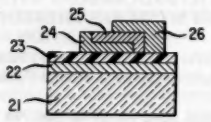
TECHNIQUE FOR NUCLEATING B.C.C. TANTALUM FILMS ON INSULATING SUBSTRATES

Eugene David Feit, Berkeley Heights, and Newton Schwartz, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 13, 1976, Ser. No. 686,118

Int. Cl.[2] C25D *11/26;* **H01G** *13/00*

U.S. Cl. 204—38 A **9 Claims**



1. In the method of making a capacitor which comprises the steps of producing a layer of tantalum on a non-conducting substrate, electrolytically anodizing a portion of the tantalum layer, and applying an electrically conductive film to the anodized portion, the improvement which comprises depositing an organic compound having a vapor pressure less than 90 torr at 190° C with a thickness of a monolayer upon said substrate prior to deposition of the tantalum layer.

4,036,709

ELECTROPLATING NICKEL, COBALT, NICKEL-COBALT ALLOYS AND BINARY OR TERNARY ALLOYS OF NICKEL, COBALT AND IRON

Edward P. Harbulak, Allen Park, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation of Ser. No. 615,195, Sept. 22, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,710

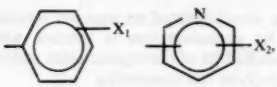
Int. Cl.[2] C25D *3/12, 3/56*

U.S. Cl. 204—43 T 14 Claims

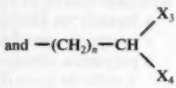
8. In a composition for the preparation of an electrodeposit which contains; at least one metal selected from the group consisting of nickel and cobalt or; binary or ternary alloys of the metals selected from nickel, iron, and cobalt; which comprises an aqueous acidic electroplating solution containing at least one member selected from nickel compounds and cobalt compounds or compounds providing nickel, cobalt and iron ions for electrodepositing nickel, cobalt, nickel-cobalt alloys, nickel-iron alloys, cobalt-iron alloys or nickel-iron-cobalt alloys, the improvement comprising the presence of 10 micromoles per liter to 2000 micromoles per liter of an organic disulfide compound or salt thereof having the formula:

$$R_1—S—S—R_2$$

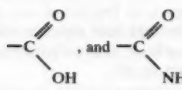
wherein R_1 and R_2 are each independently selected from



and



where *n* is an integer from 0 to 5, X_1 and X_2 are selected from —OH, $—NH_2$,



or salts thereof, X_2 may additionally be hydrogen and X_3 and X_4 are each independently selected from —H, —OH, $—NH_2$, and

or salts thereof, provided that X_3 and X_4 are not simultaneously hydrogen.

4,036,710

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 525,719, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,112, Dec. 12, 1972, abandoned. This application Dec. 24, 1975, Ser. No. 644,098

Int. Cl.[2] C25D *3/38*

U.S. Cl. 204—52 R 26 Claims

14. An aqueous acidic copper electroplating bath containing at least one member independently selected from each of the following two groups:

A. from 0.005 to 1.0 gram per liter of at least one member of the group consisting of basic diaminotriphenylmethane dyes, basic triaminotriphenylmethane dyes, basic triaminodiphenylnaphthylmethane dyes, and their reduction products; and

B. sulfoalkyl sulfide compounds containing the grouping $RS_n—Alk—SO_3M$ where n is an integer 1 to 5, where M is one gram-equivalent of a cation, where —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms, and where R is selected from a group consisting of hydrogen, a metal cation, a monovalent hydrocarbon radical including one which carries inert substituents, in which no carbon atom is bound exclusively to heteroatoms, a sulfonic group MO_3S— and a sulfolanyl group in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

4,036,711

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 641,965, Dec. 18, 1975, abandoned, which is a continuation of Ser. No. 525,716, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Sept. 17, 1976, Ser. No. 724,692

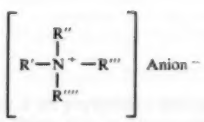
Int. Cl.[2] C25D *3/38*

U.S. Cl. 204—52 R 22 Claims

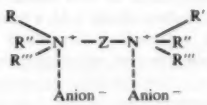
1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 gram per liter to 10.0 grams per liter of quaternized aryl and aralkyl amines selected from those exhibiting the formulae:

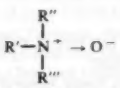
I.



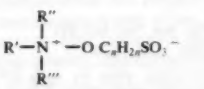
II.



III.



IV.



wherein R′, R″, R‴ and R⁗ are each independently selected from the group consisting of substituted and unsubstituted monovalent alkyl, aryl, aralkyl and cycloalkyl radicals provided that at least one aryl or aralkyl radical is present on each quaternary nitrogen atom; wherein Z is a bivalent hydrocarbon radical which may be substituted and/or interrupted by heteroatoms; wherein $n=3$ or 4; wherein the Anion may be absent if one of the radicals R′ to R⁗ carries an anionic substituents and

B. sulfoalkyl sulfide compounds containing the grouping —S—Alk—SO_3M where M is one gram-equivalent of a cation and — Alk — is a divalent radical selected from a

group consisting of unsubstituted and substituted aliphatic hydrocarbon radicals containing 2 to 8 carbon atoms which may be interrupted by heteroatoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

4,036,712

PROCESS FOR PREPARING N-(α-ALKOXYETHYL)-CARBOXYLIC ACID AMIDES

Michael Mitzlaff, Bad Homburg, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

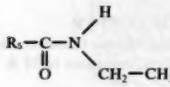
Filed Jan. 23, 1976, Ser. No. 651,693

Claims priority, application Germany, Jan. 25, 1975, 2503114; Sept. 6, 1975, 2539767

Int. Cl.[2] C25B *3/10*

U.S. Cl. 204—59 R **10 Claims**

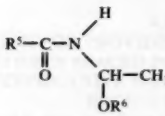
1. In a process for the alkoxylation of a secondary N-ethyl-carboxylic acid amide of the formula



wherein R^6 is alkyl of from 1 to 6 carbon atoms, in the presence aryl of from 6 to 10 carbon atoms, by electrolysis with an alcohol of the formula

$$R^6—OH$$

wherein R^6 is alkyl of from 1 to 6 carbon atoms, in the presence of a quaternary ammonium salt, an alkali salt or a combination thereof, to yield an N-α-alkoxyethyl compound of the formula



the improvement which comprises electrolysis by a current quantity of at least 2.5 Faraday/mole of acid amide in the presence of an alkali salt of tetrafluoroboric acid, a tetraalkyl ammonium tetrafluorobroate, a tetraalkyl ammonium hexa-fluorophosphate or a combination thereof, sais alkyl being of 1 to 6 carbon atoms.

4,036,713

PROCESS FOR THE PRODUCTION OF HIGH PURITY LITHIUM HYDROXIDE

Patrick M. Brown, Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed Mar. 4, 1976, Ser. No. 663,851

Int. Cl.[2] C25B *1/20, 1/26*

U.S. Cl. 204—98 **5 Claims**

1. An economical process for the production of high purity lithium hydroxide from a brine containing lithium and other alkali and alkaline earth metal halides, which comprises;

concentrating said brine to a lithium content of about 2 to about 7% to precipitate almost all of the alkali and alkaline earth metals other than lithium,

adjusting the pH of the concentrated brine to about 10.5 to about 11.5, thus precipitating substantially all of any remaining calcium, magnesium and iron contaminants,

neutralizing the thus purified brine with hydrochloric acid, and

electrolyzing the thus purified and neutralized brine as the anolyte in the electrolytic cell in which a cation selective permeable membrane separates the anolyte from the catholyte,

whereby the lithium ions in the anolyte migrate through the membrane to form high purity lithium hydroxide in the catholyte and hydrogen and chlorine are evolved at the electrodes as by-products.

4,036,714

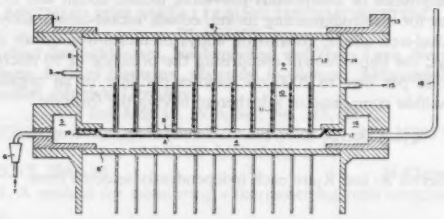
ELECTROLYTIC CELLS AND PROCESSES

Robert Spitzer, New York, N.Y., assignor to E. I. Du Pont de Nemours and Company, Inc., Wilmington, Del.

Division of Ser. No. 298,922, Oct. 19, 1972, Pat. No. 3,864,226. This application Jan. 24, 1975, Ser. No. 543,912

Int. Cl.[2] C25B *1/16, 1/26, 1/02, 1/22*

U.S. Cl. 204—99 **25 Claims**



24. A process for the electrolysis of an aqueous solution containing sodium and/or potassium ions in solution with anions of the mineral acids and/or of the organic acids and/or hydroxyl ions in an electrolytic cell comprising

a foraminous anode,

a composite membrane comprising

a polymeric membrane facing said anode and

a cathode layer of metal permeable to alkali metal ions in intimate contact with said polymeric membrane at its surface facing away from said anode, said polymeric membrane horizontally positioned to support said metal thereon and

a membrane or a diaphragm between said anode and composite membrane comprising

passing an electric current through said aqueous solution between said anode and cathode and withdrawing the anode product through said anode.

4,036,715

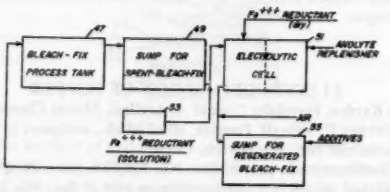
METHOD OF RECOVERING SILVER FROM PHOTOGRAPHIC BLEACH-FIX AND CONCURRENTLY REGENERATING THE BLEACH-FIX

Harry C. Baden; Charleton C. Bard, and Donald J. Brugger, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,748

Int. Cl.[2] C25C *1/20;* G03C *5/38*

U.S. Cl. 204—109 **5 Claims**



1. A method for electrolytically recovering silver from spent aqueous bleach-fix photographic processing solution containing ions of both silver and iron III comprising introducing into

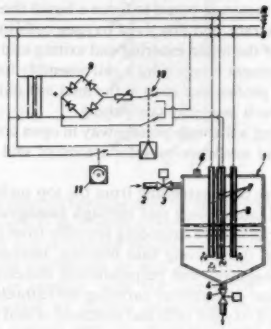
said processing solution a chemical compound characterized by the ability to reduce iron III to iron II, impressing a direct electrical current between a cathode which is immersed in a first pool of such processing solution and an anode which is immersed in a second pool of anolyte solution of a carbonate, borate phosphate or silicate, thereby plating silver onto said cathode, said first and second pools being separated from one another by non-porous cation permeable barrier or a porous barrier, and excluding air from said pools.

4,036,716

METHOD TO PREVENT THE FORMATION OF INCRUSTATIONS ON WORKING ELECTRODES IN ELECTRODE STEAM GENERATORS OR THE LIKE AND A MEANS FOR PERFORMING THE METHOD

Peter Hulthe, Vastra Frolunda, Sweden, assignor to Goteborgs Analyslaboratorium AB, Sweden

Filed Mar. 24, 1975, Ser. No. 561,080
Claims priority, application Sweden, Apr. 5, 1974, 74045931
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—147 **13 Claims**



1. A method for reducing or eliminating the formation of incrustations of water soluble materials on working electrodes which are immersed in a water bath containing said water soluble materials, said electrodes being connected to a source of alternating current, said improvement comprising the steps of:

adding an auxiliary electrode;

superimposing, between said auxiliary electrode and said working electrodes, a direct current voltage such that a low PH-value is obtained in the water near the working electrodes; and

reversing, periodically, the direct current polarity such that the working electrodes and the auxiliary electrode periodically act as an anode and as a cathode causing the PH-value of the water to vary between acidic and alkaline.

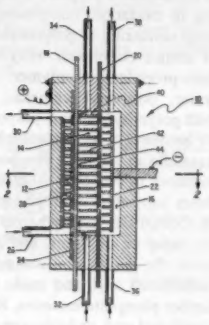
4,036,717

METHOD FOR CONCENTRATION AND PURIFICATION OF A CELL LIQUOR IN AN ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, and Leo L. Benezra, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 29, 1975, Ser. No. 644,977
Int. Cl.[2] C25B *1/02, 1/16*
U.S. Cl. 204—153 **4 Claims**

1. A method for concentrating and purifying an aqueous ceil liquor containing alkali metal hydroxide in electrolytic cell comprising the steps of: assembling a three compartment electrolytic cell having a porous catalytic anode, a porous diaphragm to divide the anode compartment from a central compartment, an essentially hydraulically impermeable cation-exchange membrane dividing the central compartment from a cathode compartment, a cathode, a stratification network contained within the central compartment and sufficient openings into the compartments to introduce and remove materials therefrom; charging the cathode compartment of the three compartment electrolytic cell with a dilute aqueous solution of pure alkali metal hydroxide; charging the central compartment with the aqueous cell liquor containing alkali metal hydroxide to be concentrated and purified and recirculation thereof; stratifying the aqueous cell liquor containing alkali metal hydroxide within the central compartment; supplying a flow of hydrogen gas to the anode compartment side of the porous



catalytic anode at a gauge pressure; preheating the electrolytic cell and materials to be charged thereto to a temperature in excess of 60° C.; applying a direct electrolyzing current across the anode and cathode of the electrolytic cell; recycling hydrogen gas emanating from the anode and cathode compartments to the anode compartment and across the porous catalytic anode; removing aqueous concentrated and pure alkali metal hydroxide from the cathode compartment; and removing aqueous impurities and alkali metal salts from the central compartment.

4,036,718

PROCESS FOR PREPARING A FRIABLE TETRAFLUOROETHYLENE POLYMER POWDER FROM UNSINTERED COAGULATED DISPERSION GRADE TETRAFLUOROETHYLENE POLYMER

Michael Trevenen Brown, Welwyn Garden City, and William George Rodway, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 267,035, June 28, 1972, abandoned, and a continuation-in-part of Ser. No. 111,700, Feb. 1, 1971, abandoned. This application Dec. 2, 1975, Ser. No. 636,957
Claims priority, application United Kingdom, Feb. 3, 1970, 5037/70; Sept. 17, 1971, 43436/71
Int. Cl.[2] C08F *2/46, 114/00*
U.S. Cl. 204—159.2 **7 Claims**

1. A process for the manufacture of a finely divided tetrafluoroethylene polymer comprising subjecting in powder form an unsintered coagulated dispersion grade of a tetrafluoroethylene polymer selected from tetrafluoroethylene homopolymers and copolymers of tetrafluoroethylene with up to 10% by weight, based on the weight of the copolymer, of an ethylenically unsaturated comonomer, to γ-radiation until it has received a dose of at least 2 M Rads, and comminuting the irradiated polymer to a finely divided form having a number average particle size less than 5 μm as measured optically.

4,036,719

IRRADIATABLE POLYMER COMPOSITION WITH IMPROVED OXIDATION RESISTANCE

Bernard J. Lyons, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 405,521, Oct. 11, 1973, abandoned. This application July 1, 1975, Ser. No. 592,243
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.14 12 Claims

1. An irradiation cross-linked polymer composition, having improved resistance to oxidation, comprising a polymer selected from the group consisting of polyethylene, polypropylene, ethylene-vinyl acetate copolymer, ethylene-acrylic ester copolymers, ethylene-propylene copolymer, ethylene-propylene-diene terpolymer, polyvinyl chloride, polyvinylidene chloride, chlorinated polyethylene and polyolefin elastomers and minor effective amounts of an organic phosphite antioxidant which is substantially an insoluble compound under effective irradiating conditions of less than 50 mrads to which the composition has been subjected, said phosphite having the general formula $R_1O(ROPOR')_nA_x$ wherein the R and R' radicals may be the same or different, and may alone or in combination comprise the group consisting of alkyl, substituted alkyl, aryl, substituted aryl, and made together form a ring and contain further phosphite moieties, R_1 is alkyl, substituted alkyl, aryl, substituted aryl, or hydrogen and may contain further phosphite moieties and A is hydrogen or OR_1, wherein n is 1 or 2, x is 0 or 1.

4,036,720

HYDROGEN ISOTOPE SEPARATION

Marion D. Clark, Oxon Hill, and Thomas J. Manuccia, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,904
Int. Cl.[2] B01K *1/00;* C01B *1/28, 4/00;* C01C *1/02*
U.S. Cl. 204—177 7 Claims

1. A method of separating isotopes of hydrogen which comprises subjecting a mixture of nitrogen and isotopes of hydrogen in a H_2— N_2 mole ratio from 1:4 to 10:1 to a glow electrical discharge from 10^{-3} to 10^{+1} eV per reactant molecule at a temperature from 50° K to 200° K and at a pressure from about 0.3 Torr to about 25 Torr if said glow electricl discharge is self-sustained or to the condensation pressure of nitrogen if said glow electrical discharge is external.

4,036,721

METHOD FOR COATING A CONDUCTIVE MATERIAL

Hisao Kato, Neyagawa; Hideo Yagi, Kyoto, and Shunji Fukuta, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 486,834, July 9, 1974, Pat. No. 3,988,231. This application May 25, 1976, Ser. No. 690,046
Int. Cl.[2] C25D *13/20*
U.S. Cl. 204—181 16 Claims

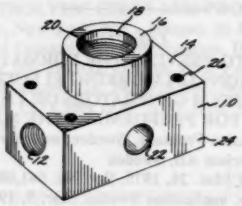
1. A method for coating a conductive material, which consists essentially of physically coating a conductive material with an inorganic composition which is substantially non-chemically reactive to the substrate, said inorganic composition containing at least a monobasic aluminum phosphate to form an inorganic coating layer and then applying thereto an organic electrodepositable composition by electrophoretic means to form an organic coating layer.

4,036,722

FLOW THROUGH CELL ASSEMBLY

Gordon R. Brushwyler, Anaheim, and Timothy F. Scott, Brea, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 21, 1975, Ser. No. 606,443
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 B 4 Claims



1. In a continuous flow respirometer having an elongated residence tube, a metering pump to force a liquid therethrough at a constant flow rate, and dissolved oxygen cells to sense the oxygen content of the liquid entering and exiting said residence tube, the improvement comprising a cell assembly for a plurality of instrument probes, one each at the inlet and outlet of said residence tube, each assembly comprising:

a housing having a through passageway in open communication with said residence tube for transit of said stream of liquid;

a first transverse bore extending from the top surface of said housing and intersecting said through passageway;

a second transverse bore extending laterally from one side of said housing, intersecting said housing, intersecting said through passageway and perpendicular thereto;

a first instrument probe meter carrying the cathode of one of said dissolved oxygen cells and mounted in said first transverse bore and terminating generally coplanar with the top surface of said through passageway; and

a second instrument probe meter carried in said second transverse bore and extending transversely across said through passageway immediately beneath, but out of contact with, the lower end of said first instrument probe to block a substantial cross section of said through passageway and be in substantial flow obstruction to said through passageway and to define a narrow flow constriction there in immediately beneath said first probe meter.

4,036,723

RF BIAS SPUTTERING METHOD FOR PRODUCING INSULATING FILMS FREE OF SURFACE IRREGULARITIES

Bradford Clyde Schwartz; Ralph Donald Silkensen, and Gerald Steving, all of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 606,692, Aug. 21, 1975, abandoned. This application June 1, 1976, Ser. No. 691,917
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 EC 22 Claims

1. In the method of forming an electrically insulative coating having a surface smoothness value of 250 A or less, peak to valley, over a polycrystalline or a microroughened substrate having surface irregularities of as great as 500 A, the steps of:

RF bias sputtering a first substantially continuous layer of electrically insulative material over said substrate at a reemission coefficient of about 0.35 or lower; and then

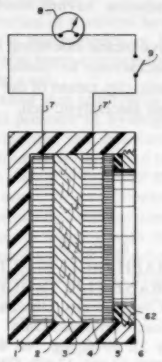
RF bias sputtering a second layer of said electrically insulative material over said first layer of electrically insulative material at a reemission coefficient of about 0.6 or greater to provide a surface smoothness of at least about 250 A, peak to valley, or smoother.

4,036,724

DEVICE FOR THE CONTINUOUS DETERMINATION OF CARBON MONOXIDE CONTENT OF AIR

Horst Binder, Petterweil; Reinhard Knodler, Diedenbergen; Alfons Kohling, Eschborn, and Gerd Sandstede, Frankfurt am Main, all of Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 455,505, March 27, 1974, abandoned. This application May 23, 1975, Ser. No. 580,532
Claims priority, application Germany, Apr. 2, 1973, 2316365
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 R 6 Claims



1. An electrochemical cell, for the continuous determination of the carbon monoxide content of a gas, such as air, in the emission and immission ranges, comprising, in combination, a receptacle containing an acid electrolyte; a cathode having a surface in contact with the electrolyte; a diffusion anode, depolarizable by carbon monoxide, having an inner active layer in contact with the electrolyte and a superposed outer hydrophobe gas diffusion layer out of contact with the electrolyte; means subjecting the anode to the carbon monoxide-containing gas by flow of the gas through said diffusion layer; said anode, at a potential of less than 1000 mV relative to a hydrogen electrode in the same electrolyte, being subject to oxygen-reduction; said cathode being constituted by an unpolarizable material, selected from the group consisting of oxides and mixed oxides of the transition metals, having an oxidation potential of over 1000 mV relative to a hydrogen electrode in the same electrolyte; and current measuring means connected, in short circuiting relation, between said cathode and said anode to polarize said anode to the potential of said cathode so that, in the absence of carbon monoxide, no current flows between said cathode and said anode and so that no oxygen-reduction takes place at said anode; whereby said anode, when subjected to a gas containing both oxygen and carbon monoxide, functions only as an anode for the oxidation of the carbon monoxide and is depolarized relative to said cathode to provide a corresponding current flow through said current measuring means; said cell functioning without any external current source.

4,036,725

WHEEL SELECTIVE JET PLATING SYSTEM

Robert M. Allen, Mill Valley, and Michael Seyffert, Santa Cruz, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 21, 1975, Ser. No. 634,046
Int. Cl.[2] C25D *17/00*
U.S. Cl. 204—206 15 Claims

1. An apparatus for electroplating metal on a continuous metal strip comprising:

a plurality of stationary fluid jets spaced along a circular line for jetting a plating fluid containing a metal against said strip;

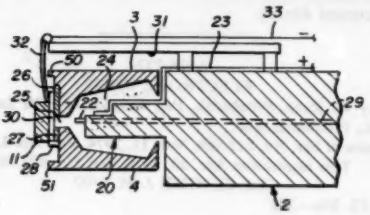
a central assembly for supporting said fluid jets in a fixed position relative to said strip, said central assembly including means for coupling said jets to a source of plating fluid under pressure;

means for moving said strip in a circular path past said jets while said fluid is being jetted from said jets against said strip;

said moving means comprising:

an annular ring-shaped assembly mounted for rotation about said central assembly, said ring-shaped assembly having an upper and a lower outer peripheral edge;

a slot between said edges in registration with said fluid jets; and



means located on opposite sides of said slot forming a fluid-sealing means between said strip and said ring-shaped assembly for masking a predetermined surface area of said strip;

means for rotating said ring-shaped assembly about said central assembly;

means for holding said strip against said masking means in a fluid-tight sealing relationship therewith as said ring-shaped assembly is rotated about said central assembly; and,

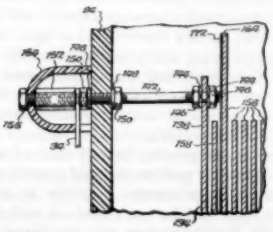
means for causing a current to flow in said fluid; including means for coupling a d.c. current source between said strip and said fluid jets whereby said metal in said plating fluid is removed from said fluid and plated on the surface of said strip between said masking means as said strip is moved past said fluid jets.

4,036,726

METHOD AND APPARATUS FOR ELECTROCHEMICAL CONTAMINANT REMOVAL FROM LIQUID MEDIA

Stephen B. Gale, Williamsville; Phillip P. O'Donnell, Buffalo, and Stanley Bruckenstein, Williamsville, all of N.Y., assignors to Andco Incorporated, Buffalo, N.Y.

Division of Ser. No. 547,940, Feb. 7, 1975. This application Feb. 2, 1976, Ser. No. 654,563
Int. Cl.[2] C02B *1/82*; C02C *5/12*; C25C *7/00, 7/02*
U.S. Cl. 204—231 13 Claims



1. In an electrochemical cell for removing a contaminant ion from an ionizing medium and having a cell body:

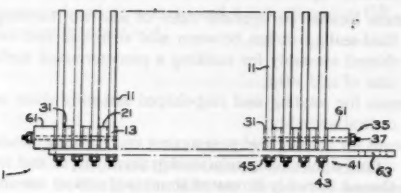
a. a pair of outer electrode elements positioned in said body in spaced apart relation;
b. means for applying electrical potentials of opposite polarity directly to said outer electrodes;
c. additional electrode elements between said outer electrode elements in closely spaced relation;
d. means in said cell body defining a flow path for an ionizing medium in operative relation to said electrodes;
e. whereby the electric potentials applied to said outer electrode elements induce electric charge on said additional electrode elements to cause electric current flow through said ionizing medium; and
f. one of said additional electrode elements in neighboring relation to a corresponding one of said outer electrode elements being of sufficient size so as to extend beyond said outer electrode element so as to shield said outer electrode element from flux field effects causing excessive current density.

4,036,727

ELECTRODE UNIT

Henry W. Rahn, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 522,669, Nov. 11, 1974, Pat. No. 3,984,304. This application Apr. 20, 1976, Ser. No. 678,781
Int. Cl.[2] C25B *1/26, 9/02*
U.S. Cl. 204—268 **3 Claims**



1. A bipolar electrolyzer comprising a plurality of electrolytic cells electrically and mechanically in series, at least one of said comprising an anode assembly of one bipolar unit and a cathode assembly of the next adjacent bipolar unit in the electrolyzer;

A. said anode assembly comprising:

1. a plurality of parallel silicon anodes, each of said anodes comprising a silicon substrate having an electrical conductivity greater than about 100 (ohm-centimeters)$^{-1}$, an electrically conductive surface thereon, an aperture passing through the base portion of said silicon substrate, and elastic clip means on the base of said silicon anodes adapted for connection with corresponding means on the cathode assembly of adjacent bipolar electrolyte cell;
2. a plurality of electrolyte-resistant spacers, at least one of said spacers being disposed between a pair of adjacent silicon anodes, each of said spacers having an aperture corresponding to the apertures in said silicon substrates;
3. a plurality of flexible gaskets, at least one of said flexible gaskets being interposed between a spacer and the silicon adjacent to one surface thereof, and at least one of said flexible gaskets being interposed between the opposite surface of the spacer and the silicon anode adjacent thereto; each of the said flexible gaskets having an aperture corresponding to the apertures in the silicon substrates and the spacers;
4. compressive means passing through each of said silicon anodes, said flexible gaskets, and said spacers, providing a compressive force thereon whereby to provide an electrolyte tight seal between each of said silicon anodes and the flexible gaskets adjacent thereto, and between each of said spacers and the flexible gaskets adjacent thereto, whereby to form an electrolyte tight wall having silicon anodes extending outwardly from one side thereof and electrical connection means extending on the opposite side thereof;

B. said cathode assembly comprising:

1. an electrolyte permeable, metal backscreen, extending substantially from one edge of the bipolar unit to the opposite edge thereof and substantially from the bottom of the bipolar unit to the top thereof, and substantially parallel to and spaced from the anodic unit of the next adjacent electrolyte cell;
2. a plurality of hollow, finger-like metal cathodes joined to said backscreen at the bases thereof, extending outwardly from said backscreen and interleaved between said anodes; said cathodes having electrolyte permeable walls;
3. electroconductive means extending from said cathodes through said backscreen to elastic clip means corresponding to elastic clip means of the anode assembly of the next adjacent electrolytic cell.

4,036,728

CONVERTING A DIAPHRAGM ELECTROLYTIC CELL TO A MEMBRANE ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 21, 1976, Ser. No. 688,842
Int. Cl.[2] C25B *11/03, 13/08;* **C25C** *7/04*
U.S. Cl. 204—283 **8 Claims**

1. A method for forming a membrane over a standard diaphragm cell foraminous electrode comprising the steps of: suspending a matting material in a fluid medium; inserting a foraminous electrode into the suspension; vacuum forming a layer of the suspended matting material over the surface of the foraminous electrode so as to substantially reduce the porosity of the foraminous electrode material; applying to the surface of the foraminous electrode with the matting material thereon, a layer of thermoplastic material including NAFION particles in the sulfonyl fluoride form; baking the foraminous electrode with the layers in place until the thermoplastic material is fused into a thin and uniform film on the surface of the matting material which is substantially impermeable to hydraulic flow; and hydrolyzing the NAFION to change the sulfonyl fluoride form to the cation exchange sulfonic acid form.

4,036,729

DIAPHRAGMS FROM DISCRETE THERMOPLASTIC FIBERS REQUIRING NO BONDING OR CEMENTING

Arvind S. Patil, 8253 Colony Drive, Grosse Ile, Mich. 48138, and Eugene Y. Weissman, 356 N. Clifton, Birmingham, Mich. 48010

Filed Apr. 10, 1975, Ser. No. 566,911
Int. Cl.[2] C25B *13/06, 13/08*
U.S. Cl. 204—296 **7 Claims**

1. In an electrolytic cell having a diaphragm deposited on a cathode screen, an improved diaphragm therefor, comprising:
an entanglement of highly branched thermoplastic polymeric fibers, the fibers being capable of withstanding the internal conditions of the cell, the fibers being of the type produced by extruding a polymer melt in the presence of an auxiliary liquid medium which shears the melt into the highly branched fibers, and
wherein the fibers are entangled to a degree such that they are free of bonding or cementing agents.

4,036,730

SOLVENT-REFINING OF COAL

Andries Brink, Sasolburg; Cornelis Kleynjan, Lochvaal, and Quintin John Beukes, Sasolburg, all of South Africa, assignors to South African Coal, Oil & Gas Corporation Limited, South Africa

Filed May 20, 1975, Ser. No. 579,145
Claims priority, application South Africa, May 24, 1974, 74/3326
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 30 Claims

1. A process for the production of solvent-refined coal which comprises the steps of:

a. heating coal slurried in a solvent having hydrogen carrier characteristics in the presence of hydrogen at a partial pressure of several times atmospheric pressure to substantially liquefy the coal,

b. during said heating step controlling the heating temperature and partial pressure of hydrogen to attain a rate of free radical formation, said rate being a function of temperature, which exceeds the rate of radical hydrogenation, said latter rate being a function of partial pressure of hydrogen, and continuing said control or a period of time sufficient to chemically combine a small percentage of the liquefiable matter of the coal with the resulting formation of larger nondissolved solid particles, and

c. separating non-dissolved solids from the solution formed by said liquefying and control steps.

4,036,731

HYDROGENATION OF COAL

Terence Geoffrey Martin, Winchcombe, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Oct. 28, 1975, Ser. No. 626,102
Claims priority, application United Kingdom, Dec. 19, 1974, 54981/74
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 7 Claims

1. A process for the hydrogenative extraction of coal characterized by

extracting coal with an organic solvent in the presence of a hydrogen donor at a temperature greater than the critical temperature of said solvent, said temperature being within the range of 340° C to 480° C,

separating the gas phase extract from the solids residue, and

condensing the extracted products from the gaseous or vapor phase.

4,036,732

TAR SANDS EXTRACTION PROCESS

Cyrus A. Irani, Westfield; Edward W. Funk, Linden; Ernesto Gomez, Elizabeth, and Ramon L. Espino, Summit, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 6, 1975, Ser. No. 547,640
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE 7 Claims

1. In a process for the extraction of bitumen from tar sands, the improvement which comprises countercurrent contacting of the tar sands in an extraction zone with a solvent consisting essentially of paraffins having from 5 to 9 carbon atoms at a ratio of from 2 to 10 parts by weight solvent per part bitumen present in the tar sand, maintaining the asphaltene fraction of the tar sands in suspension in a solution of a major portion of the bitumen in the major portion of said solvent in said extraction zone, separating said solution along with the suspended asphaltenes from said extraction zone, separating said solution from said asphaltenes, passing said separated solution to a distillation zone and therein distilling off said solvent, passing extracted sand from said extraction zone along with a minor portion of said solvent and a minor portion of bitumen into a water contacting zone and therein contacting said extracted sand with sufficient water at a temperature of at least 100° F. to separate substantially all of the bitumen and the solvent from said sand.

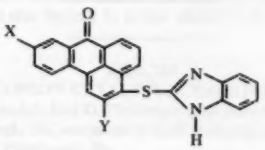
4,036,733

FLUORESCENT BENZANTHRONIC DYES

Filippo Maria Carlini, Novara; Giampiero Pieri, Saronno (Varese); Camillo Paffoni, Pogno (Novara), and Gioacchino Boffa, Novara, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Apr. 21, 1976, Ser. No. 679,029
Claims priority, application Italy, Apr. 24, 1975, 22722/75
Int. Cl.[2] C10G *41/00*; C10L *1/24*; C07D *235/04*; C08K *5/16*
U.S. Cl. 208—12 10 Claims

1. A plastosoluble fluorescent organic dye derived from benzanthrone, and having the general formula:



(I)

wherein

X = —H or —Br; and

Y = —H, —OCH_3 or —OC_2H_5.

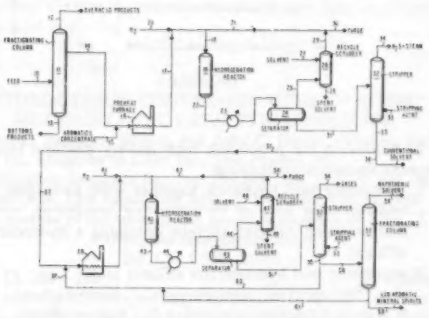
10. A bulk-dyed polystyrene, polymethylmethacrylate, rigid PVC, polyethylene, acrylonitrile/butadiene/styrene copolymer, polycarbonate or mineral oil, wherein the dye has the general formula (I) as defined in claim 1.

4,036,734

PROCESS FOR MANUFACTURING NAPHTHENIC SOLVENTS AND LOW AROMATICS MINERAL SPIRITS

Richard S. Manne; Sam R. Bethea, and Edward A. Kelso, all of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 2, 1973, Ser. No. 412,065
Int. Cl.[2] C10G *23/00*
U.S. Cl. 208—57 16 Claims



1. A process for the simultaneous production of a naphthenic hydrocarbon liquid useful as a naphthenic solvent and a low aromatics hydrocarbon liquid useful as mineral spirits which comprises blending a hydrocarbon oil boiling within the range between about 100° F. and about 600° F. with an aromatics concentrate which contains at least 50 weight percent aromatics compounds, has an initial boiling point about the same as that of said hydrocarbon oil, and boils within the range between about 100° F. and about 600° F., said hydrocarbon oil having a lower aromatics content then said aromatics concentrate, to produce a blend containing in excess of about 10 weight percent aromatic compounds; hydrogenating said

blend in the presence of a hydrogenation catalyst under conditions sufficient to convert aromatics present in said blend into lower boiling naphthenic compounds; fractionating the hydrogenated blend; and recovering a highly naphthenic overhead fraction containing naphthenic constituents boiling below the initial boiling points of said hydrocarbon oil and said aromatics concentrate and a bottoms fraction of low aromatics content containing constituents present in said blend prior to hydrogenation.

4,036,735

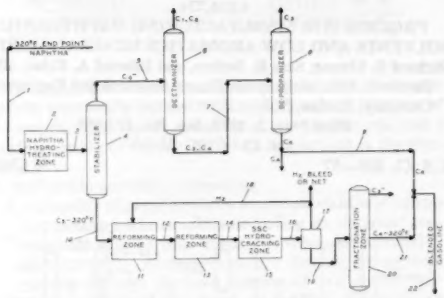
PROCESS FOR UPGRADING MOTOR GASOLINE

Ronald R. Roselius, Richmond, and Alexander G. Edeleanu, Moraga, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 2, 1973, Ser. No. 347,100

Int. Cl.[2] C10G *39/00*

U.S. Cl. 208—89 **9 Claims**



1. A process for producing high quality gasoline from a naphtha feedstock comprising:

1. contacting said feedstock together with hydrogen in a hydrotreating zone at hydrotreating conditions, with a hydrotreating catalyst, thereby obtaining a hydrocarbon effluent;
2. separating said hydrocarbon effluent into
   a. a first fraction comprising C_4^- hydrocarbons, and
   b. a second fraction comprising C_5^+ hydrocarbons;
3. contacting at least a portion of said second fraction and hydrogen in a reforming zone at reforming conditions, with a reforming catalyst, thereby obtaining a reformate;
4. contacting at least a portion of said reformate and hydrogen in a hydrocracking zone at hydrocracking conditions with a shape selective hydrocracking catalyst, thereby obtaining a hydrocracking zone effluent comprising a normally gaseous hydrocarbon product and a C_4^+ normally liquid product; and
5. blending at least the C_5^+ portion of said C_4^+ normally liquid product and at least a portion of C_4 hydrocarbons from said first fraction to obtain said high quality gasoline.

4,036,736

PROCESS FOR PRODUCING SYNTHETIC COKING COAL AND TREATING CRACKED OIL

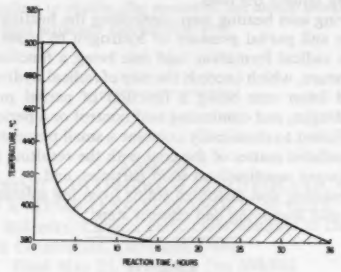
Hiromi Ozaki, Urawa; Mamoru Yamane, Tokyo; Haruo Yoshikai, and Hachio Kodama, both of Toda, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 583,698, June 4, 1975, abandoned, which is a continuation of Ser. No. 428,412, Dec. 26, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,309

Claims priority, application Japan, Dec. 22, 1972, 47-128176; July 2, 1973, 48-73676; Germany, Dec. 14, 1973, 2362252; France, Dec. 21, 1973, 73.45985

Int. Cl.[2] C01G *9/36*

U.S. Cl. 208—106 **9 Claims**



1. A process for producing synthetic coking coal which comprises delayed coking a heavy hydrocarbon oil by:

heating said heavy hydrocarbon oil in a furnace to a coking temperature of from about 380° to about 500° C and sufficient to initiate cracking;

then introducing the heated heavy hydrocarbon oil into a coking drum;

maintaining the heavy hydrocarbon oil in said coking drum for a time ranging from ½ to about 36 hours at said coking temperatures to effect coking thereof;

introducing a diluent gas into the body of said hydrocarbon oil in the coling drum at a flow rate greater than 5 l/hr kg of heavy hydrocarbon oil to maintain the partial vapor pressure of the cracking product vapor over said heavy hydrocarbon oil in said coking drum at about 50 to about 600 mm Hg during said coking;

and recovering a synthetic coking coal having a free-swelling index greater than 4 and containing 20–40 wt.% volatile matter.

4,036,737

HYDROCRACKING IN STRONG ACID SYSTEMS WITH NOBLE METAL COMPONENT

Jos Wristers, Plainfield; Michael Siskin, Maplewood, and Joseph J. Porcelli, Scotch Plains, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 317,610, Dec. 22, 1972, Pat. No. 3,901,790. This application May 14, 1975, Ser. No. 577,350

Int. Cl.[2] C10G *13/08*

U.S. Cl. 208—108 **13 Claims**

1. A hydrocracking process which comprises contacting a hydrocarbon feedstock which has an initial boiling point of at least about 215° C with hydrogen, under hydrocracking conditions, and with a substantially liquid phase acid catalyst comprised of:

a. a metal fluoride wherein the metal is selected from the group consisting of tantalum, niobium, boron and mixtures thereof;

b. an acid selected from the group consisting of hydrofluoric acid, C_1–C_4 trifluoroalkylsulfonic acid, fluorosulfonic acid and trifluoroacetic acid; and

c. a supported Group VIII noble metal hydrogenation com-

ponent; the acid being present in at least an equimolar ratio relative to the metal fluoride and at least a portion of the metal fluoride is dissolved in the acid, the hydrogenation component being dispersed in the liquid acid phase and recovering a hydrocarbon product having an average molecular weight lower than the molecular weight of the feedstock.

4,036,738

HYDROCRACKING IN STRONG ACID SYSTEMS WITH PALLADIUM OR IRIDIUM

Jos Wristers, Plainfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed May 14, 1975, Ser. No. 577,349

Int. Cl.[2] C10G *13/08*

U.S. Cl. 208—108 **14 Claims**

1. A hydrocracking process which comprises contacting a hydrocarbon feedstock which has an initial boiling point of at least about 215° C with hydrogen, under hydrocracking conditions, and with a substantially liquid phase acid catalyst comprised of:

a. a metal fluoride wherein the metal is selected from the group consisting of tanalum, niobium, boron and mixtures thereof;

b. an acid selected from the group consisting of hydrofluoric acid, C_1-C_4 trifluoroalkylsulfonic acid, and trifluoroacetic acid; and

c. a supported palladium or iridium hydrogenation component; the acid being present in at least an equimolar ratio relative to the metal fluoride and at least a portion of the metal fluoride is dissolved in the acid, the supported palladium or iridium being dispersed in the liquid acid phase and recovering a hydrocarbon product having an average molecular weight lower than the molecular weight of the feedstock.

4,036,739

CATALYTIC CRACKING PROCESS USING AMMONIA-STABLE ZEOLITE CATALYST

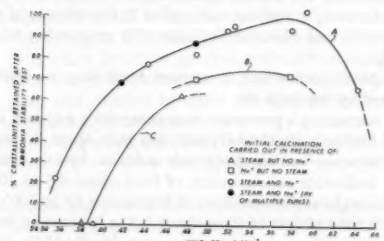
John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of America, Los Angeles, Calif.

Continuation-in-part of Ser. No. 406,684, Oct. 15, 1973, Pat. No. 3,929,672, which is a continuation-in-part of Ser. No. 191,123, Oct. 20, 1971, abandoned, and Ser. No. 236,185, March 20, 1972, Pat. No. 3,781,199. This application July 22, 1975, Ser. No. 598,114

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.[2] C10G *11/04*; B01J *29/12*

U.S. Cl. 208—120 **10 Claims**


% CRYSTALLINITY RETAINED AFTER AMMONIA STABILITY TEST
UNIT CELL SIZE, Å
INITIAL CALCINATION CARRIED OUT IN PRESENCE OF:
STEAM, BUT NO Na+
Na+ BUT NO STEAM
STEAM AND Na+
STEAM AND Na+ (AS OF WAITTLE RUN)

1. A process for the catalytic cracking of a hydrocarbon feedstock to produce lower boiling hydrocarbons, which comprises contacting said feedstock, under non-hydrogenative cracking conditions, with a cracking catalyst comprising a major proportion of a refractory oxide of a difficulty reducible metal, and intimately admixed therewith a minor proportion of an ammonia-stable Y zeolite composition prepared by the steps of:

1. calcining an ammonium-sodium Y zeolite containing about 0.6 – 5 weight-percent of sodium as Na_2O, said calcining being carried out at a temperature between about 600° and 1650° F in contact with at last about 0.2 psi of water vapor for a sufficient time to substantially reduce the unit cell size of said zeolite and bring it to a value between about 24.40 and 24.64 A;
2. subjecting the calcined zeolite to further ammonium ion exchange under conditions adjusted to replace at least about 25 percent of its residual zeolitic sodium ions with ammonium ions and produce a final product containing less than about 1 weight-percent Na_2O; and
3. calcining the product from step (2) at a temperature between about 600° and 1500° F for a time sufficient to effect substantial deammoniation, but insufficient to reduce the unit cell size thereof to below about 24.40 A.

4,036,740

HYDROCARBON CATALYTIC CRACKING PROCESS

Thomas C. Readal; Joel D. McKinney, and Robert A. Titmus, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 28, 1975, Ser. No. 625,836

Int. Cl.[2] C10G *11/04*; B01J *8/24*

U.S. Cl. 208—120 **7 Claims**

1. In a process which comprises contacting a hydrocarbon feed with a cracking catalyst in a cracking zone under cracking conditions to produce a lower boiling gasoline fraction and thereafter heating the deactivated catalyst in the presence of oxygen in a regeneration zone to a temperature in the range of 800° to 1600° F. until the concentration of carbon on the catalyst is less than 0.3 weight percent; the improvement which comprises conducting the cracking process until the concentration of metal contaminants on the catalyst is at least 1500 ppm nickel equivalents, determining the carbon dioxide and carbon monoxide concentrations in the gaseous effluent withdrawn from said regeneration zone, and adjusting the rate of flow in said hydrocarbon feed to said cracking zone of a treating agent selected from the group consisting of antimony, bismuth, manganese and compounds of such treating agents convertible to the oxide form so as to maintain a volume ratio of carbon dioxide to carbon monoxide in said gaseous effluent of at least 2.2.

4,036,741

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Mar. 3, 1976, Ser. No. 663,418

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.[2] C10G *35/06*

U.S. Cl. 208—139 **27 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state

under hydrocarbon conversion conditions or in a mixture of these states.

24. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the corresponding elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,036,742
HYDROCARBON CONVERSION WITH AN ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 656,925, Feb. 10, 1976, which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,059. This application Aug. 9, 1976, Ser. No. 713,020
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **28 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon conversion conditions with an acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.001 to about 1 wt. % germanium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

25. An acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.001 to about 1 wt. % germanium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,036,743
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 20, 1976, Ser. No. 724,892
Int. Cl.[2] C01G *35/08*
U.S. Cl. 208—139 **23 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % bismuth, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

23. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % bismuth, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,036,744
OLEFIN SEPARATION PROCESS

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 531,656, Dec. 11, 1974, Pat. No. 3,969,223, which is a continuation-in-part of Ser. No. 423,599, Dec. 10, 1973, abandoned, which is a division of Ser. No. 317,861, Dec. 22, 1972, Pat. No. 3,929,669. This application July 28, 1975, Ser. No. 599,918
Int. Cl.[2] C10G *25/04;* B01J *29/08*
U.S. Cl. 208—310 Z **10 Claims**

1. In a process for the separation of olefins from a feed mixture comprisng olefins and saturates which process comprises the steps of:

a. contacting at adsorption conditions said mixture with an adsordent comprising sodium type Y zeolite; and,

b. selectively adsorbing said olefins to the substantial exclusion of said saturates and thereafter recovering said olefins,

the improvement which comprises employing an adsorbent prepared by the steps of:

i. contacting a precursor mass comprising a type Y zeolite having a Na_2O/al_2O_3 ratio less then about 0.7 with an aqueous sodium hydroxide solution having a sodium hydroxide cencentration of from about 0.5 to 10% by weight at a temperature of from about 50° to 300° F. for a time period of from about 0.5 to 5 hours to increase the sodium cation content to a Na_2O/Al_2O_3 ratio of greater than about 0.7 and to remove from about 1 to about 15 wt.% silica and alumina from the precursor mass;

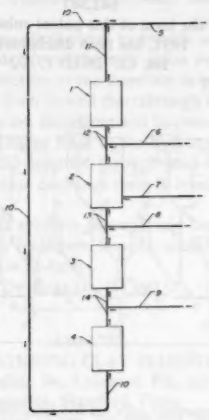
ii. washing said mass with water maintained at pH greater than 7 to remove excess sodium hydroxide solution and,

iii. at least partially dehydrating said mass at dehydrating conditions.

4,036,745
PROCESS FOR SEPARATING NORMAL AND ISOPARAFFINS

Donald B. Broughton, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 24, 1975, Ser. No. 616,470
Int. Cl.² C10G *25/04*
U.S. Cl. 208—310 Z 14 Claims



1. In a process for the separation of normal paraffins from a feed stream containing a mixture of normal paraffins and isoparaffins along with aromatic hydrocarbons which process employs an adsorbent consisting essentially of a 5A zeolite and comprises the steps of:

a. contacting said adsorbent with said feed at adsorption conditions to effect the selective adsorption of normal paraffins and a portion of the aromatic hydrocarbons by said adsorbent;

b. removing a raffinate stream comprising less selectively adsorbed isoparaffins from said adsorbent;

(c) contacting said adsorbent with a desorbent material at desorption conditions to effect the desorption of normal paraffins from said adsorbent;

(d) removing from said adsorbent an extract stream comprising normal paraffins, and;

(e) passing at least a portion of said extract stream to a separation means and therein separating at separation conditions normal paraffins from desorbent material,

The improvement which comprises using a two-step desorption operation which comprises the steps of:

i. contacting at first desorption conditions said adsorbent with a first desorbent material, said material comprising an aromatic hydrocarbon having a boiling point different than said mixture to effect the desorption of said feed aromatic hydrocarbons;

ii. removing a first extract stream comprising said feed aromatic hydrocarbons and said first desorbent material from said adsorbent;

iii. contacting at second desorption conditions said adsorbent with a second desorbent material to effect the desorption of normal paraffins:

iv. removing a second extract stream comprising normal paraffins and second desorbent material from said adsorbent; and

v. passing at least a portion of said second extract stream to a separation means and therein separating at separation conditions normal paraffins from said second desorbent material.

4,036,746
FLOTATION WITH AMINE-STABILIZED DIALKYL DITHIOPHOSPHATES

Lawrence Evans Strow, and Franklin Anderson Bolth, both of Baltimore, Md., assignors to Minerec Corporation, New York, N.Y.

Division of Ser. No. 497,905, Aug. 16, 1974, Pat. No. 3,971,836.
This application Mar. 22, 1976, Ser. No. 669,256
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 3 Claims

1. In the flotation of finely divided copper sulfide ores for the recovery of contained mineral values, the improvement comprising utilizing as a promoter therein a neutralized storage-stable mixture of:

an aqueous solution of a dialkyl dithiophosphate having the general formula

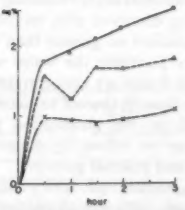
$$[R-O]_2-\underset{\underset{S}{\|}}{P}-S-Me$$

where R is an alkyl group having 3 to 6 carbon atoms and Me is a dissociating cation; said solution being neutralized with sufficient caustic to remove all initial acidity and 0.5 to 5% by weight of a trialkyl amine.

4,036,747
ADSORBENT FOR RECYCLING ARTIFICIAL KIDNEY

Masatake Hori, and Shintaro Kikuchi, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 446,105, Feb. 26, 1974, abandoned.
This application June 24, 1975, Ser. No. 589,835
Claims priority, application Japan, Feb. 27, 1973, 48-23508
Int. Cl.² B01D *13/00*
U.S. Cl. 210—22 A 1 Claim



1. In a method for removing uremic wastes from dialyzed fluid in an artificial kidney of the recycle type which comprises treating artificial kidney dialyzate with an adsorbent, the improvement according to which the adsorbent consists essentially of activated carbon and gel-type alumina, the ratio of activated carbon to gel-type alumina being 10:1 to 10:10 by weight, the gel-type alumina employed being that produced by the process which comprises neutralizing an aqueous solution of an aluminum salt by the addition of an alkali, removing the salt formed and other solutes by aqueous washing to obtain an alumina sol, maintaining said sol in a hydrophobic medium under heating to thereby cause it to age into a gel and drying the said gel, the gel-type alumina containing silica in an amount of from 0 to 30% by weight.

4,036,748

ASYMMETRIC, SEMIPERMEABLE MEMBRANES OF POLYBENZ-1,3-OXAZINE DIONES-(2,4)

Birger Knickel, Meerbusch-Lang; Rudolf Binsack, Krefeld; Hans Rudolph, Krefeld; Hans Jurgen Rosenkranz, Krefeld, and Ludwig Bottenbruch, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 16, 1975, Ser. No. 568,605

Claims priority, application Germany, Apr. 19, 1974, 2418996

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **6 Claims**

1. In the method of desalination of sea water by reverse osmosis employing a membrane, the improvement wherein said membrane is an asymmetric semipermeable membrane of a homoor copoly-benz-1,3-oxazine dione-(2,4).

4,036,749

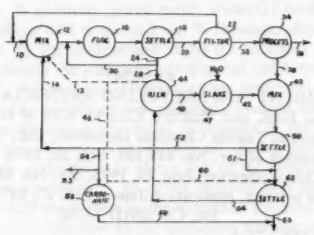
PURIFICATION OF SALINE WATER

Donald R. Anderson, 3062 Blume Drive, Los Alamitos, Calif. 90720

Continuation-in-part of Ser. No. 573,045, April 30, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,620

Int. Cl.[2] B01D *13/02, 21/01;* **C02B** *1/20*

U.S. Cl. 210—23 H **10 Claims**



1. A method for selectively removing calcium salts from raw water containing dissolved salts, including calcium bicarbonate, in a total amount no greater than about 10,000 parts per million, and for purifying the water wherein said dissolved salts in said raw water are concentrated in a residual portion during said purification thereof to a content approaching their solubility limits at the purification processing conditions, which comprises the following sequential steps for reducing the volume of said residual portion:

a. adding magnesium hydroxide precipitant to the raw water in an amount sufficient to precipitate calcium carbonate settling said precipitate, and recovering a treated water having a substantially reduced dissolved calcium content that said raw water and passing said treated water to said processing;

b. processing said treated water to separate a purified water from a residual water enriched with salts by reverse osmosis, distillation, electrodiaylsis or freezing;

c. adding calcium hydroxide to at least a portion of the residual water from said processing in an amount sufficient to precipitate soluble magnesium values in said waste brine as insoluble magnesium hydroxide; and

d. separating magnesium as magnesium hydroxide from said waste brine and returning the separated magnesium hydroxide as substantially the entirity of the precipitant to step (a).

4,036,750

USE OF ACTIVATED FLUID COKE TO REMOVE ORGANIC CONTAMINANTS FROM WASTE WATERS

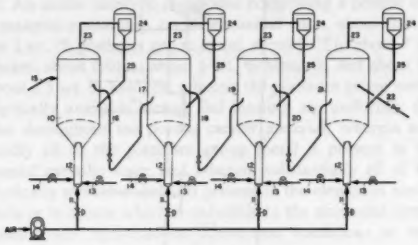
Stanley E. Jaros, North Plainfield, N.J., and William J. Metrailer, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 454,279, March 25, 1974, abandoned, which is a continuation of Ser. No. 267,232, June 28, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,587

The portion of the term of this patent subsequent to Oct. 18, 1991, has been disclaimed.

Int. Cl.[2] B01D *15/02*

U.S. Cl. 210—27 **14 Claims**



1. A countercurrent process for removing organic contaminants from waste water which comprises the steps of:

1. introducing activated fluid coke suspended in water into the top of a vessel;
2. introducing said waste water into the bottom of the vessel and passing the same upwardly therethrough in contact with said activated fluid coke;
3. removing in a water slurry from the bottom of said vessel activated fluid coke containing organic contaminants; and
4. recovering waste water depleted in organic contaminants from the top of the vessel;

said activated fluid coke being characterized by having a total surface area of at least 400 square meters per gram, a pore volume of at least 0.2 cubic centimeters per gram, an ash content of about 0.15 weight percent and an average particle size ranging from about 50 to about 600 microns.

4,036,751

METHOD OF TREATING WATER CONTAINING CHROMATE

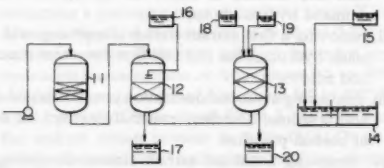
Nobuhiro Orita; Koichi Yabe, both of Yokohama, and Akifumi Kawanami, Kohnosu, all of Japan, assignors to Kurita Water Industries Ltd., Osaka, Japan

Filed Apr. 30, 1976, Ser. No. 681,781

Claims priority, application Japan, Jan. 23, 1976, 51-6807

Int. Cl.[2] B01D *15/06;* **B01J** *1/09;* **C02B** *1/56, 1/76*

U.S. Cl. 210—35 **12 Claims**



1. A method of treating water contaminated with chromate ions, which consists essentially of the steps of

a. flowing said water through a bed of weakly acidic cation exchange resin, at least a major portion of which is in

H-form, to adjust the pH of the water to from 3 to 5 and to transform the chromate ions in said water to bichromate ions,

b. then passing the water discharged from step (a) through one or more beds of weakly basic, salt-form, anion exchange resin to remove bichromate ions from said water,

c. and recovering a treated water product from the water discharged from step (b)

the steps (a), (b) and (c) being carried out until the bichromate ion content of the treated water product rises to a selected level,

d. then flowing an alkali metal hydroxide solution through said bed of beds of weakly basic anion exchange resin in the reverse direction to the direction in which the water has previously been flowed therethrough in order to elute the bichromate ion therefrom and to convert said weakly basic anion exchange resin to the hydroxyl form,

e. flowing an acid solution through said bed or beds of weakly basic anion exchange resin to transform same into said salt form,

f. flowing an acid solution through said bed of cation exchange resin to transform same to weakly acidic cation exchange resin in H-form

and then repeating the steps (a), (b) and (c).

4,036,752

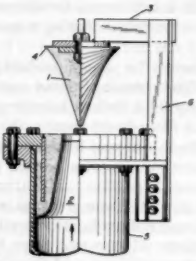
DEWATERING CLAY SLURRIES

Marvin Stevens Lassiter, Sr., Lakeland, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 543,763, Jan. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 410,840, Oct. 29, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,031

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—46 **6 Claims**



1. A process for removing water from slurried waste clay products of ore processing operations comprising

depositing slurried slimes of about 3 to 5 % solids into a mined out area until the area is full,

removing supernatant water settling the slimes, from the settled clay wastes until about one foot of water remains upon the slurried slimes,

floating sprinkler heads on the water the sprinkler heads being attached to spray line means connected to a source of sand slurry.

spraying sand slurry over the surface of the waste product with a spray nozzle unit comprised of a nozzle mounted in a pipe tee for dispersing the sand slurry upward, a cone deflector with a configuration of a Tractrix curve mounted with brackets above the nozzle on a vertical arm which connects at its lower end to the pipe tee, and pressure means for propelling the sand slurry through the nozzle and against and away from the cone to cause a circular spray of sand slurry wherein the ratio of waste sands sprayed over waste clays varies from 25/75 to 75/25 on dry weight basis and removing water from the sand sprayed slurry.

4,036,753

PYROLYSIS PROCESS FOR TREATING SEWAGE SLUDGE CONTAINING CHROMIUM

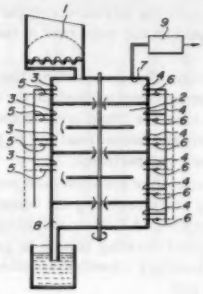
Tsuyoshi Majima, Toyokawa, and Katsunosuke Hara, Kariya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed July 6, 1976, Ser. No. 703,011

Claims priority, application Japan, July 18, 1975, 50-87896

Int. Cl.[2] C02C *3/00*

U.S. Cl. 210—63 R **3 Claims**



1. A pyrolysis process for treating sewage sludge containing chromium, which comprises

burning combustible gas produced by thermal decomposition of the sewage sludge in a pyrolysis furnace by supplying oxygen of less than the theoretical amount necessary for burning the sewage sludge, and

keeping the partial pressure of oxygen in the furnace substantially at zero.

4,036,754

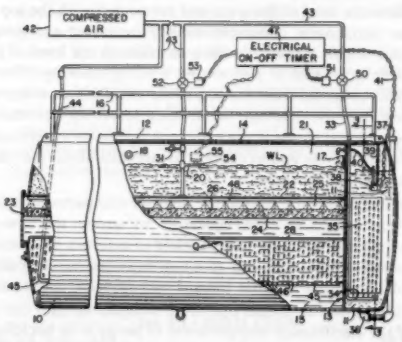
SEWAGE TREATMENT APPARATUS

Howard P. Peasley, 7923 Chowning Road, Richmond, Va. 23229

Filed Aug. 4, 1976, Ser. No. 711,762

Int. Cl.[2] C02C *1/12*; B01D *23/24*

U.S. Cl. 210—139 **12 Claims**



1. Apparatus for treating a mixed liquor of sewage water and solids by bacterial digestion to recover clarified effluent water, comprising:

a. a main treatment tank having means to introduce sewage into the tank and having means to aerate and circulate the mixed liquor, and having a smaller internal clarification compartment communicating into the main tank at a location about which the liquor circulates;

b. effluent pipe means coupled with the clarification compartment and operative to drain clarified effluent therefrom when the liquid level in the clarification compartment is at the drainage level of the pipe;

c. an auxiliary compartment adjacent the main treatment tank and separated therefrom by a weir located higher than said drainage level and disposed so that a proportion of the mixed liquor circulting in the main tank will overflow the weir into the auxiliary compartment when the level of the liquid in the main tank is raised to said weir level;

d. means for periodically backflushing the contents of the clarification compartment to displace the contents into the main tank and raise the liquid level in the tank above the level of the weir and cause overflow of the mixed liquor into the auxiliary compartment;

e. second means operative between each periodic backflushing for aerating and circulating the contents of said auxiliary compartment, and further including means for disabling said second aerating means to permit settling of solids in the auxiliary chamber to leave a supernatant liquid therein; and

f. means for transferring the supernatant liquid back into the main tank.

9. Apparatus for treating sewage materials by bacterial digestion to recover clarified effluent water therefrom, comprising:

a. a closed main treatment tank having a partition at the one end, the partition having an overflow weir therethrough at a first level near the top of the tank;

b. means for delivering raw sewage into the tank;

c. a clarification compartment comprising an outer wall which is approximately cylindrical about a horizontal axis, the compartment being small in volume as compared with the volume of the main tank and being disposed with its axis near the center of the tank, and the compartment having a longitudinal slot opening through its bottom communicating into the main tank;

d. a digester compartment connected to the tank at the partition and located to receive overflow from the main tank via the weir when the level in the main tank exceeds said first level, and having means to draw off materials from the bottom of the digester compartment;

e. an effluent pipe extending into the tank at a second level below the level of the weir, and connected with the top of the clarification compartment and including a drainage valve which is normally open to maintain the level of the water in the tank at said second level by draining effluent water collected from the top of the clarification compartment, and the drainage valve being selectively closeable;

f. first aeration means in the main tank operative to aerate the sewage therein and to cause it to circulate about the clarification compartment;

g. second aeration means in the digester compartment selectively controllable to inject air to aerate the sewage therein and to cause it to circulate to maintain solid materials in suspension, and to cease injecting air to permit solid materials to settle toward said draw-off means; and

h. compressed air means operative to inject air into the top of the clarification compartment to purge it by backflushing its contents through said slot and displace the contents into the main tank, the volume of the clarification compartment being sufficient that when its contents are displaced into the tank part of the contents of the main tank overflow the weir into the digester compartment.

4,036,755

FILTER FOR CLEANING LUBRICATING OIL IN INTERNAL COMBUSTION ENGINES

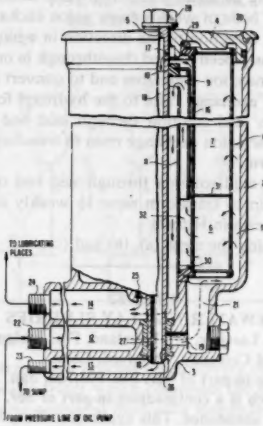
Wolfram Dahm, Raidwangen; Josef Lederhaas, Denkendorf; Roland Merkle; Horst Lutz, both of Stuttgart; Peter Moser, Weinstadt-Beutelsbach; Friedrich Noltemeyer, Hohenacker, and Heinz Roger, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 19, 1975, Ser. No. 642,568

Claims priority, application Germany, Dec. 19, 1974, 2460073

Int. Cl.[2] F01M *1/10*

U.S. Cl. 210—168 **23 Claims**



1. A filter for cleaning lubricating oil in internal combustion engines comprising

at least one filter insert means for cleaning lubricating oil, said filter insert means including a main filter and a fine filter arranged coaxially;

filter housing means for accommodating said filter insert means, said filter housing means comprising a housing member having (a) a hollow interior portion for accommodating said filter insert means, (b) an insert opening disposed at the top of said housing member for inserting said filter insert means, (c) a bottom portion closing off said hollow interior portion, said bottom portion including a plurality of separate channel means in operative communication with said hollow interior portion for respectively introducing dirty oil into said filter housing means and discharging clean oil from said filter housing means, and (d) cover means for covering said insert opening;

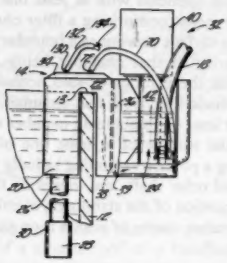
bolt means engaging said bottom portion for securing said cover means to said housing member, said bolt means including bore means axially extending from a geodetically upper portion of said housing member at said cover means to a geodetically lower portion of said housing member at said bottom portion for circulating auxiliary clean oil from said fine filter from said geodetically upper portion to a first of said plurality of separate channel means for discharging said auxiliary clean oil;

drainage connection means for operatively communicating said first channel means with said hollow interior portion separately from a second of said plurality of separate channel means for introducing said dirty oil, said drainage connection means being operatively closed off by an end portion of said bolt means at said bottom portion, wherein, upon moving said end portion to open said drainage connection means, oil from said hollow interior portion drains through said first channel means;

partition pipe means extending approximately over the entire length of said fine filter for conducting said auxiliary clean oil from said fine filter to said bore means at said geodetically upper portion;

upright pipe means provided between said partition pipe means and said bolt means for conducting main clean oil from said main filter to a third of said plurality of separate channel means for discharging said main clean oil, said upright pipe means extending from approximately said geodetically upper portion and being connected to said bottom portion so that said main clean oil flows from said approximately geodetically upper portion to said third channel means separately from said second channel means.

4,036,756
AQUARIUM FILTER ASSEMBLY
Denzel J. Dockery, 3317 E. Bristol Road, Burton, Mich. 48529
Filed June 10, 1975, Ser. No. 585,691
Int. Cl.[2] E04H *3/20*
U.S. Cl. 210—169 **11 Claims**



1. For use with an aquarium tank having at least one vertical wall and an interior at least partly filled with water, a device comprising,

a filter having an inlet and an outlet with said filter outlet open to the interior of said aquarium tank,

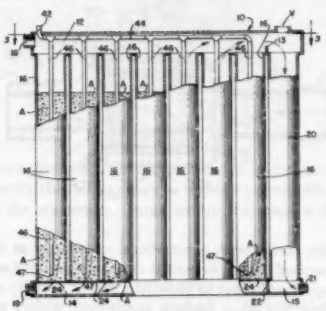
a housing adapted to be mounted on one wall of said aquarium tank, said housing having a first hollow portion positioned on the interior of and extending downwardly into the tank so that the interior of the housing first portion is in fluid communication with the water in the interior of the tank, a second hollow portion adapted to sit upon said last mentioned wall of said tank so that the interior of the housing second portion is open to the upper end of the interior of the housing first portion, a third hollow portion positioned exteriorly of said tank, the interior of said third portion forming a downwardly extending fluid channel open at its top to the interior of said second housing portion, and a fourth hollow portion disposed exteriorly of said tank and horizontally adjacent said third housing portion, wherein the interior of said fourth portion is in fluid communication with the bottom of said fluid channel and whereby fluid communication is established between the interiors of said tank and said housing fourth portion through the interiors of said housing first, second, and third portions,

pump means carried in said housing fourth portion, said pump means having a housing, said pump housing having a fluid inlet open to the interior of said fourth housing portion and a fluid outlet fluidly connected to said filter inlet, and

venturi passage means integrally formed in said pump housing for creating a partial vacuum at a port in said pump housing upon actuation of said pump means, and

conduit means for connecting said port to an upper part of said housing second portion and open to the interior of said housing second portion, whereby upon actuation of said pump means, said venturi passage means and said conduit means evacuate the interior of said housing second portion and siphon water from said aquarium tank into the interior of the housing second portion to thereby establish water flow from said aquarium tank into the interior of said housing fourth portion.

4,036,757
BACKFLUSH FILTER SYSTEM
Howard P. Peasley, 7923 Chowning Road, Richmond, Va. 23229
Filed Aug. 4, 1976, Ser. No. 711,763
Int. Cl.[2] B01D *23/24, 29/08*
U.S. Cl. 210—196 **9 Claims**



1. A filter system to be backflushed during a purge cycle, the filter system being coupled to receive substantially clarified water from a main treatment unit, said system comprising:

a. multiple upright filter columns, each column being tall and narrow and having an upper end and a lower end and each column being substantially filled with filter aggregate;

b. upper header means communicating with the upper ends of said filter columns, and having an inlet connected to receive said substantially clarified water;

c. lower header means communicating with the lower ends of said filter columns and having an outlet to discharge the filtered water from the columns;

d. backflush receiving tube means communicating with the upper header means and coupled to means operative to discharge into said main treatment unit during a purge cycle;

e. means for introducing compressed air during purge cycles into the filter aggregate comprising a stand pipe entering each filter column from above the upper end thereof and extending through the aggregate and having an opening substantially at the lower end of each column, pipe means connecting the upper ends of the stand pipes to a source of compressed air, and valve means connected in said pipe means and operative during purge cycles to admit compressed air into the stand pipes;

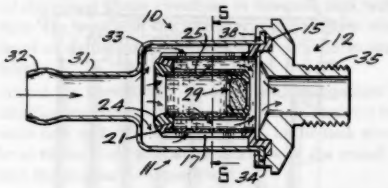
f. means for backflushing filtered water upwardly in the columns from the lower header means during purge cycles simultaneously with said introduction of compressed air and the upward flow thereof from the opening in each stand pipe; and

g. control means for initiating said purge cycles and opening said valve means.

4,036,758
FLUID FILTER
John F. Combest, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio
Filed Sept. 8, 1976, Ser. No. 721,804
Int. Cl.[2] B01D *35/06*
U.S. Cl. 210—223 **10 Claims**

1. A fluid filter comprising, in combination, an external housing encompassing an internal filter structure, said housing including a generally hollow shell having an open end and a closed end with a fluid inlet fitting therein and an end bell secured over said open end with a fluid outlet generally oppo-

site said fluid inlet, said internal filter structure including a first hollow filter basket, having an outer diameter less than the inner diameter of said housing and having a peripheral flange on one end secured between the adjacent surfaces of said shell and said end bell to position it axially within said shell between said filter inlet and outlet, and first filter basket further including a circumferential wall of fluid filter media and an opposite end positioned axially toward said fluid inlet, and a second hollow filter basket positioned coaxially within said first basket, said second basket also including a circumferential wall of



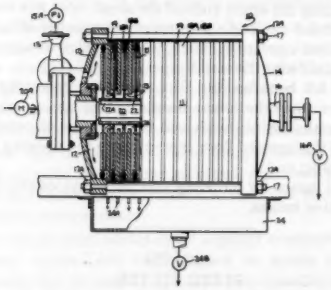
fluid filter media with a peripheral end flange at the inlet end of said second basket in nested engagement with said opposite end of said first basket to provide a pair of radially spaced apart circumferential filter baskets positioned within said housing between the inlet and outlet thereof, and an impervious radially extending fluid barrier extending across the peripheral outlet end of said second basket whereby fluid entering said housing is caused to flow either radially outwardly through said filter media of said second basket or radially inwardly through the filter media of said basket toward said said fluid outlet.

4,036,759

APPARATUS AND SYSTEM FOR STABILIZING THE DISC ELEMENTS OF A ROTARY CONCENTRATOR FOR SOLIDS-CONTAINING FLUIDS

James Donovan, Cambridge, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Continuation of Ser. No. 596,639, July 17, 1975, Pat. No. 3,989,629. This application Sept. 17, 1976, Ser. No. 724,176
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.[2] B01D *25/38*
U.S. Cl. 210—298 **3 Claims**



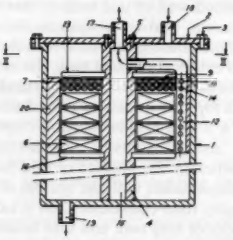
1. In an apparatus for continuous separation of a solids-containing fluid into a vehicle fluid and a concentrated slurry of solids which includes (1) a housing characterized by an interior surface and a longitudinal axis and having an inlet for introducing a solids-containing fluid into said housing and an outlet for removing a concentrated slurry of solids therefrom; (2) at least two substantially parallel, coaxially disposed, spaced-apart annular elements mounted within said housing on the longitudinal axis thereof and established stationarily with respect thereto between said inlet and said outlet; (3) a rotor shaft extending within said housing along the longitudinal axis thereof and passing coaxially through said annular elements in spaced diametral relation thereto leaving openings for fluid flow between the outer surface of said shaft and the inner circumferential surfaces of said annular elements, said shaft being rotatable with respect to said housing and said annular elements, and (4) a radially extensive rotor element having one side and another, opposite side and an outside edge mounted to said rotor shaft to turn therewith with its outside edge terminating in spaced relation to the interior surface of said housing and positioned between said spaced-apart annular elements to define a flow path for solids-containing fluid from said inlet to said outlet extending across at least one side of one of said spaced-apart annular elements between it and one side of said rotor elements, then between the outside edge of said rotor element and the interior surface of said housing and then between the other, opposite side of said rotor element and the other of said annular elements with at least one of those elements being a filter means comprising a filter chamber having at least one filtering surface serving as a boundary of said flow path with the interior of that chamber being in fluid flow communication with the exterior of said housing for the removal of filtrate vehicle fluid from that chamber, the improvement comprising at least one stabilizing member secured to the inner circumferential surface of at least one of said annular elements and having a portion extending radially from said one element toward said rotor shaft, and means on the rotor shaft for receiving said portion of the stabilizing member in a circular recess the generative center of which is on the longitudinal axis of the rotor shaft.

4,036,760

FLUID FRACTIONATING MEMBRANE APPARATUS

Claude Bardonnet, Lyon; Robert Brun, Bollene, and Michel Pages, St. Martin D'Ardeche, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed July 3, 1975, Ser. No. 592,993
Claims priority, application France, July 5, 1974, 74.23440
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—323 R **11 Claims**



1. Fluid fractionating apparatus comprising, in combination:

a. a jacket;

b. at least one core within said jacket;

c. at least one coil comprising at least two continuous porous membrane support elements, each having internally at least one longitudinal channel, each of the at least two continuous support elements being wound uniformly around the at least one core, which thereby acts as a support for the said at least one coil;

d. a membrane covering each said support element externally within said jacket and being adherent to said at least one support element;

e. a manifold extending within said jacket and communicating with the exterior of the apparatus and connected in a leakproof manner to the longitudinal channel at at least

one end of each said continuous porous membrane support elements; and

f. a fluid inlet and a fluid outlet for introducing and extracting a fluid to and from said jacket, the said fluid being thus able to flow in the jacket and outside the membrane support elements.

4,036,761

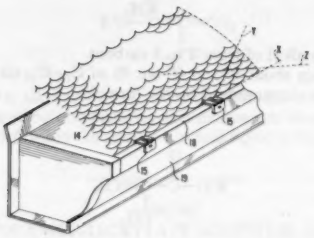
GUTTER GUARD

Armand T. Rankin, New Albany, Ind., assignor to Stone City Products, Inc., Bedford, Ind.

Filed July 22, 1976, Ser. No. 707,779

Int. Cl.[2] B01D *25/04, 23/00*

U.S. Cl. 210—474 **2 Claims**



1. In combination with a flanged gutter attached to the leading edge of a sloped roof of a building, a screen guard therefor utilizing an elongated screen extending along the length of said gutter and there across, said screen consisting of two diagonally intersecting members forming the apex of a triangle-shaped aperture, and the member constructed and arranged to provide a base for said triangular-shaped opening of said screen, a plurality of substantially U-shaped clips spaced along the length of the flange of said gutter, the upper portion of said clips consisting of a horizontal member with one end resiliently connected to the spring clip, and with at least one rotational node constructed and arranged between the ends of said horizontal member, the third member of said screen forming the base of the triangular-shaped opening therein, located under said rotational node and above the upper surface of the flange of said gutter whereby said screen may be rotated into two rotational positions, one position being located on the edge of the gutter flange nearest the roof and the other position being located directly to the rear of the first node on the outer edge of the flange.

4,036,762

WIRELESS REMOTE-CONTROL SYSTEM FOR A CAMERA OR THE LIKE

Otto Troetscher, Aalen; Erwin Wiedmann, Essingen; Horst Stahl, Oberkochen, and Helmut Forberich, Bad Kreuznach, all of Germany, assignors to Carl Zeiss-Stiftung, Wurttemberg, Germany

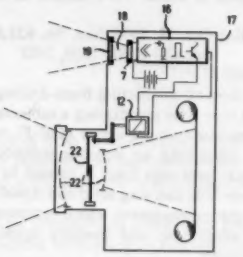
Filed Sept. 15, 1975, Ser. No. 613,426

Claims priority, application Germany, Sept. 17, 1974, 2444355

Int. Cl.[2] H04B *9/00, 1/06*

U.S. Cl. 250—199 **7 Claims**

1. A wireless system for the remote control of a camera or the like, said camera or the like having a response to radiation of a first spectral character within a predetermined field of view, said system comprising a pulse-generating transmitter of radiation of second spectral character essentially outside said first special character said transmitter including means for the selective control of pulsed radiation thereform, and a receiver having a maximum spectral response substantially matched to the output of said transmitter, said receiver producing an electrical-output camera-control signal in response to detected pulse radiation from said transmitter, and said receiver including means for directionally focusing the received radiation and for fixedly mounting the same to a camera in substantial alignment with the field of view of the camera, the last-defined means establishing for said receiver a field of view of substantially the same angular dimensions as those of said camera field of view, whereby the camera may be remotely controlled upon operation of the transmitter from within the camera field of view.



4,036,763

NOISE AND DRIFT CORRECTING AMPLIFIER CIRCUIT FOR A LIVE-SCAN IMAGING SYSTEM

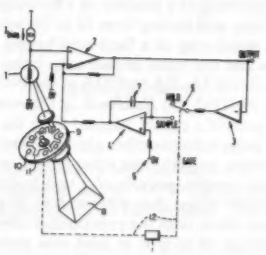
Peter Robert Norman Stephenson, Stevenage, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Aug. 11, 1975, Ser. No. 603,736

Claims priority, application United Kingdom, Aug. 14, 1974, 35759/74

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—214 C **3 Claims**



1. Line-scan imaging apparatus including electrical circuitry automatically correcting for noise and drift, comprising a radiation detector which is repeatedly scanned across an image to build up a raster consisting of a succession of active scan lines with dead times between, a D.C. preamplifier having first and second inputs and receiving and amplifying the detector signal applied thereto on said first input, a further D.C. amplifier having first and second inputs and a feedback capacitor connected between its output and its first input, means applying a reference voltage to the second input of said further D.C. amplifier, means applying the output of said further D.C. amplifier to the second input of said preamplifier, means applying the output of the preamplifier to the first input of said further D.C. amplifier which means include a sample and hold switch that when closed applies the output from the preamplifier to said first input of said further D.C. amplifier but can be opened to remove the preamplifier output from said further amplifier, and means for automatically opening said switch during each line scan and closing said switch during each dead time.

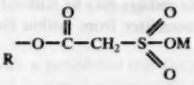
4,036,764

METHOD OF FOAM DRILLING USING A SULFOACETATE FOAMING AGENT

Paul W. Fischer, Whittier, and David S. Pye, Brea, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 14, 1975, Ser. No. 621,685
Int. Cl.[2] C09K 7/08, 7/02
U.S. Cl. 252—8.5 C **9 Claims**

1. In the method of conducting foam drilling and workover operations in a bore hole penetrating a subterranean formation having a temperature above about 400° F, wherein foam is generated by contacting an aqueous solution of a foaming agent with a gas, and said foam is caused to flow upwardly through the bore hole carrying solid and liquid materials out of the bore hole, the improvement which comprises employing in said aqueous solution as said foaming agent a composition having the formula:



wherein R is a straight chain alkyl radical having from 10 to 16 carbon atoms; and M is an alkali metal or ammonium cation.

4,036,765

RUN-FLAT TIRE LUBRICANT

Marvin T. Conger, Akron, and Roger N. Beers, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 11, 1975, Ser. No. 585,923
Int. Cl.[2] C10M 3/18, 5/02, 7/08; B60C 5/00
U.S. Cl. 252—21 **5 Claims**

1. A pneumatic tire run-flat assembly lubricant which is nonflowable below 70° C. and flowable at temperatures higher then 90° C. consisting of a mixture on a by-weight basis of 2 to 60 parts of a fatty acid having from 12 to 24 carbon atoms, 0 to 45 parts of a metal soap of a fatty acid having from 12 to 24 carbon atoms and the metal of said soap being selected from the metals of Group IA, IIA and IIIA of the Periodic Table set forth at Vol. 39 (1957–58) *Handbook of Chemistry and Physics* and 40 to 92 parts of a carrier selected from the group consisting of water, polypropylene ether glycol or triol of 400 to 3500 molecular weight, polyethylene ether glycol or triol of 400 to 3800 molecular weight, polyols of 2 to 4 hydroxyls having a molecular weight of less then 400 and 0 to 20 parts of a powdery pyrogenic silica, with the proviso that when the carrier is water the amount of soap is at least two percent by weight based on the water.

4,036,766

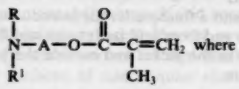
POLYMETHACRYLATE ADDITIVES AND LUBE COMPOSITIONS THEREOF

Roy I. Yamamoto, Wappingers Falls; Abraham Morduchowitz, Monsey, both of N.Y.; Wheeler C. Crawford, Houston, Tex., and Carmen M. Cusano, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 14, 1976, Ser. No. 696,150
Int. Cl.[2] C10M 1/32
U.S. Cl. 252—51.5 A **8 Claims**

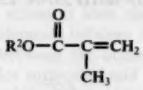
1. A complex polymethacrylate-liquid poly(alkene-1) product of a polymethacrylate to polyalkene component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate of a molecular weight of between about 5×10^4 and 10^6 composed of the following monomeric elements:

a. between about 1 and 10 wt. % dialkylaminoalkyl methacrylate characterized by the formula:



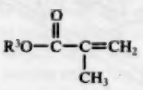
where R and R^1 are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

b. between about 15 and 30 wt. % C_1–C_6 alkyl methacrylate characterized by the formula:



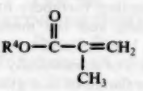
where R^2 is alkyl of from 1 to 6 carbons

c. between about 40 and 60 wt. % of C_{10}–C_{14} alkyl methacrylate characterized by the formula:



where R^3 is of from 10 to 14 carbons, and

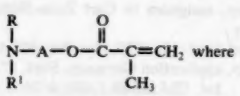
d. between about 15 and 30 wt. % of C_{16}–C_{20} alkyl methacrylate characterized bythe formula:



where R^4 is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

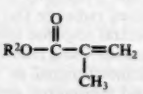
2. A mineral oil composition comprising between about 10 and 95 wt. % mineral lubricating oil and between about 0.1 and 90 wt. % of a complex polymethacrylate-polyalkene product of a polymethacrylate component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate interpolymer of a molecular weight of between about 5×10^4 and 10^6 composed of the following monomeric elements:

a. between about 1 and 10 wt. % dialkylaminoalkyl methacrylate characterized by the formula:



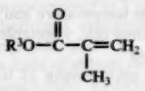
where R and R^1 are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

b. between about 15 and 30 wt. %% C_1–C_6 alkyl methacrylate characterized by the formula:



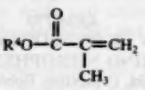
where R^2 is alkyl of from 1 to 6 carbons

c. between about 40 and 60 wt. % of C_{10}–C_{14} alkyl methacrylate characterized by the formula:



where R^3 is alkyl of from 10 to 14 carbons

d. between about 15 and 30 wt. % of C_{16}–C_{20} alkyl methacrylate characterized by the formula:



where R^4 is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

4,036,767

POLYMETHACRYLATE ADDITIVES AND LUBRICATING COMPOSITIONS THEREOF

Roy I. Yamamoto, Wappingers Falls; Abraham Morduchowitz, Monsey, both of N.Y.; Wheeler C. Crawford, Houston, Tex., and Carmen M. Cusano, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

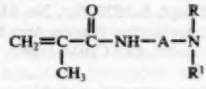
Filed June 14, 1976, Ser. No. 696,151

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 A **6 Claims**

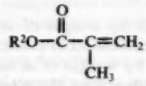
1. A complex polymethacrylate-liquid poly(alkene-1) product of a polymethacrylate to polyalkene component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate of a molecular weight of between about 5×10^4 and 10^6 composed of the following monomeric elements:

a. between about 1 and 10 wt. % N,N-diaminoalkyl methacrylamide characterized by the formula:



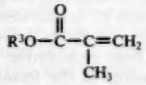
R and R^1 are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

b. between about 15 and 30 wt. % C_1–C_6 alkyl methacrylate characterized by the formula:



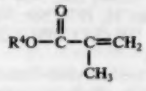
where R^2 is alkyl of from 1 to 6 carbons

c. between about 40 and 60 wt. % of C_{10}–C_{14} alkyl methacrylate characterized by the formula:



where R^3 is alkyl of from 10 to 14 carbons, and

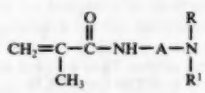
d. between about 15 and 30 wt. % of C_{16}–C_{20} alkyl methacrylate characterized by the formula:



where R^4 is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

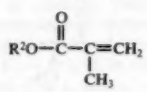
2. A mineral oil composition comprising between about 10 and 95 wt. % mineral lubricating oil and between about 0.1 and 90 wt. % of a complex polymethacrylatepolyalkene product of a polymethacrylate to polyalkene component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate interpolymer of a molecular weight of between about 5×10^4 and 10^6 composed of the following monomeric elements:

a. between about 1 and 10 wt. % N,N-diaminoalkyl methacrylamide characterized by the formula:



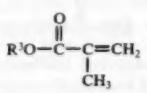
R and R^1 are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

b. between about 15 and 30 wt. % C_1–C_6 alkyl methacrylate characterized by the formula:



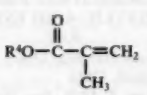
where R^2 is alkyl of from 1 to 6 carbons

c. between about 40 and 60 wt. % of C_{10}–C_{14} alkyl methacrylate characterized by the formula:



where R^3 is alkyl of from 10 to 14 carbons

d. between about 15 and 30 wt. % of C_{16}–C_{20} alkyl methacrylate characterized by the formula:



where R^4 is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

4,036,768

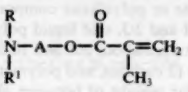
POLYMETHACRYLATE AND LUBE COMPOSITION THEREOF

Wheeler C. Crawford, Houston, Tex.; Roy I. Yamamoto, Wappingers Falls, and Carmen M. Cusano, Poughkeepsie, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 14, 1976, Ser. No. 696,152
Int. Cl.[2] C10M *1/28*
U.S. Cl. 252—51.5 A **6 Claims**

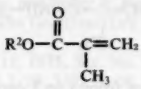
1. A complex polymethacrylate-liquid alkylbenzene product of a polymethacrylate to alkylbenzene component weight ratio of between about 4:1 and 2:3, said liquid alkylbenzene of a molecular weight between about 100 and 5000, said polymethacrylate of a molecular weight of between about 5×10^4 and 10^6 composed of the following monomeric elements:

a. between about 1 and 10 wt. % dialkylaminoalkyl methacrylate characterized by the formula:



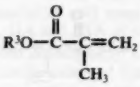
R and R^1 are alkyl of from 1 to 2 carbons
A is alkanediyl of from 1 to 5 carbons

b. between about 15 and 30 wt. % C_1–C_6 alkyl methacrylate characterized by the formula:



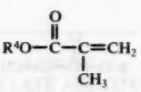
where R^2 is alkyl of from 1 to 6 carbons

c. between 40 and 60 wt. % of C_{10}–C_{14} alkyl methacrylate characterized by the formula:



where R^3 is alkyl of from 10 to 14 carbons

d. between about 15 and 30 wt. % of C_{16}–C_{20} alkyl methacrylate characterized by the formula:



where R^4 is alkyl of from 16 to 20 carbons, said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid alkylbenzene.

4,036,769

SPERM OIL SUBSTITUTE FROM BLEND OF ALCOHOL-CARBOXYLIC ACID ESTERS WITH LIQUID FAT

Robert L. Zipf, Parma Heights, Ohio, assignor to Werner G. Smith, Inc., Cleveland, Ohio

Filed Apr. 5, 1971, Ser. No. 131,531
Int. Cl.[2] C10M *1/38*
U.S. Cl. 252—48.6 **9 Claims**

1. A liquid lubricant comprising a blend consisting essentially of:

a. from about 50 percent to about 90 percent by weight of synthetic esters of monohydric alcohols each having 10 to 18 carbon atoms and fatty acids each having 12 to 24 carbon atoms, at least one of said esters containing carbon-to-carbon unsaturation, and

b. from about 10 percent to about 50 percent by weight of a fat liquid at room temperature and selected from the class consisting of animal oils, vegetable oils, fish oils and mixtures thereof, and

c. free fatty acids each having 12 to 24 carbon atoms and being present in an amount such that the acid number of the blend is less than 15 but at least about 5,

said blend having an iodine number from about 50 to about 140, a pour point below 50° F. and a S.U.S. viscosity at 100° F. within the range of about 60 to about 120.

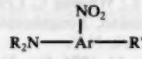
4,036,770

STABILIZATION OF HYDROCRACKED OILS WITH AMINO NITROPHENOLS

Wilton F. Espenscheid, Princeton; Robert D. Offenhauer, Pennington, and Tsoung Y. Yan, Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,280
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 R **7 Claims**

1. A method of stabilizing a hydrocracked lubricating oil from deterioration caused by light and air comprising adding to said oil a stabilizing amount of a compound of the formula:



wherein Ar is phenyl or diphenyl, R is the same or different and is selected from the group consisting of phenyl, hydrogen and alkyl containing from 1 to 18 carbon atoms and R′ is hydrogen or an alkyl containing from 1 to 18 carbon atoms, and wherein the R_2N and NO_2 groups are ortho or para to each other.

4,036,771

LUBRICATING BASES FOR MULTIGRADE OILS

Jacques Denis, Ville d'Avray, and Guy Parc, Rueil Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sept. 5, 1975, Ser. No. 610,769
Claims priority, application France, Apr. 16, 1975, 75.12053
Int. Cl.[2] C10M *1/24*
U.S. Cl. 252—56 R **52 Claims**

1. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a dimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H-O-R_1)_nOH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, and diols having the general formula $HO-R_1'-OH$, in which R_1' is a divalent hydrocarbon radical, and with at least one hydrocarbyl monohydroxyl compound selected from monohydric hydrocarbyl alcohols, monohydric phenols of the formula R_2–OH, oxyalkyl-

enated monohydric hydrocarbyl alcohols, and oxyalkylenated monohydric phenols of the formula $R_2—O(R_1—O)_nH$, wherein R_2 is an aliphatic, alicyclic or aromatic monovalent hydrocarbyl radical, and n' is a number of from 1 to 50, the reagents being employed in proportions which substantially correspond to 2 moles of dimeric acid for 1 mole of dihydroxyl compound and 2 moles of monohydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

12. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 $(CH_2)_x$ to 50% by weight of at least one complex ester composition produced by the esterification of a dimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H— O — R_1)_n OH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, and diols having the general formula $HO — R_1' — OH$, in which R_1' is a divalent hydrocarbon radical, and with at least one hydrocarbyl monohydroxyl compound selected from monohydric hydrocarbyl alcohols, monohydric phenols of the formula $R_2—OH$, oxyalkylenated monohydric hydrocarbyl alcohols, and oxyalkylenated monohydric phenols of the formula $R_2—O(R_1-O)_nH$, wherein R_2 is an aliphatic, alicyclic or aromatic monovalent hydrocarbyl radical, and n' is a number of from 1 to 50, the reagents being employed in proportions which substantially correspond to 3 moles of dimeric acid for 2 moles of dihydroxyl compound and 2 moles of monohydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

23. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a dimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, and at least one monocarboxylic acid having the general formula R'_2COOH, in which R'_2 is a monovalent hydrocarbon radical with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H — O—R_1)_n OH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, the reagents being employed in proportions which substantially correspond to 1 mole of dimeric acid and 2 moles of monocarboxylic acid for 2 moles of dihydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

33. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a trimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H — O — R_1)_n OH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, and diols having the general formula $HO — R_1' — OH$, in which R_1' is a divalent hydrocarbon radical, and with at least one monohydroxyl compound selected from monohydric hydrocarbyl alcohols, monohydric phenols of the formula $R_2 — OH$, in which R_2 is an aliphatic, alicyclic or aromatic hydrocarbyl monovalent radical, and oxyalkylenated hydrocarbyl monohydric alcohols or monohydric phenols having the general formula $R_2 — O — R_1 — O)_n H$, in which R_1 and R_2 are as defined above and n' is a number of from 1 to 50, the reagents being employed in proportions which substantially correspond to 2 moles of trimeric acid for 1 mole of dihydroxyl compound and 4 moles of monohydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

43. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a trimeric

acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, and at least one monocarboxylic acid having the general formula $R_2'COOH$, in which R_2' is a monovalent hydrocarbon radical, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H-O-R_1)OH$, in which R_1 is a 1,2, alkylene radical and *n* is a number of from 2 to 50, the reagents being employed in proportions which substantially correspond to 1 mole of trimeric acid and 3 moles of monocarboxylic acid for 3 moles of dihydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

4,036,772

ESTERS MADE FROM THE REACTION PRODUCT OF LOW MOLECULAR WEIGHT ETHYLENICALLY UNSATURATED ACYLATING AGENTS AND OXIDIZED ETHYLENE-PROPYLENE INTERPOLYMERS

Casper John Dorer, Jr., Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 3, 1975, Ser. No. 554,362
Int. Cl.² C10M *1/24*
U.S. Cl. 252—56 R **28 Claims**

1. A composition of matter comprising at least one ester made from:

A. at least one high molecular weight carboxylic acid reagent prepared by reaction of (1) a low molecular weight, ethylenically unsaturated carboxylic acid reagent with (2) an oxidized, degraded ethylene-propylene interpolymer having a molecular weight of at least 700 and obtained by heating a higher molecular weight ethylene-propylene interpolymer at a temperature of at least 100° C. in the presence of oxygen to cause reduction of at least about 5% in the molecular weight of said interpolymer, and

B. at least one mono- or polyhydric alcohol of the formula

$R(OH)_n$

wherein R is a hydrocarbon-based group of one to about forty carbon atoms and n is one to about six.

8. A lubricant composition comprising a major amount of oil and a viscosity improving or sludge dispersing amount of at least one composition as claimed in claim **1.**

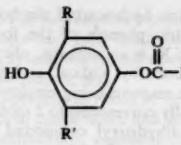
4,036,773

LUBRICANT COMPOSITIONS CONTAINING CARBOXYLIC ACID ESTERS OF HINDERED HYDROQUINONES

Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,777
Int. Cl.² C10M *1/24*
U.S. Cl. 252—56 R **10 Claims**

1. A lubricant composition comprising a major amount of a mineral lubricating oil, a synthetic lubricating oil or greases thereof and an amount sufficient to impart antioxidant properites thereto of an ester of a hindered hydroquinone, said ester having the formula



wherein R and R′ contain from 3 to 20 carbon atoms and are selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkaryl and R″ contains from 1 to 25 carbon atoms and is the same as R and R′.

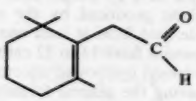
4,036,774

FRAGRANT SOAP COMPOSITIONS CONTAINING ALPHA-SUBSTITUTED ACETALDEHYDE AND KETONE

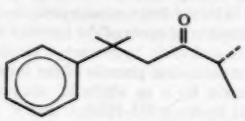
Anton van Ouwerkerk, Livingston, N.J.; Bernard J. Chant, Rye, and Arthur L. Liberman, Beechhurst, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 601,727, Aug. 4, 1975. This application Nov. 11, 1976, Ser. No. 741,141
Int. Cl.² C11B *9/00*; C11D *3/50, 9/44*
U.S. Cl. 252—132 **2 Claims**

2. A soap consisting essentially of (*i*) a mixture consisting essentially of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde having the structure:



and at least one phenyl C_6 ketone having the structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; and (*ii*) a soap base; the ratio of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde:phenyl C_6 ketone being in the range of from 1:1 up to about 1:5; and the ratio of said mixtures:said soap base being 1:100.

4,036,775

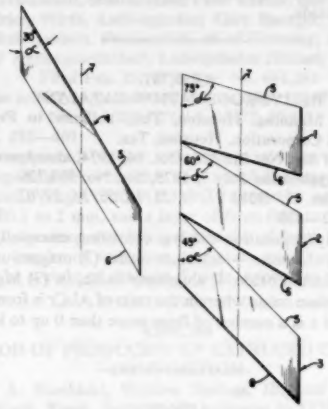
PROCESS FOR THE PRODUCTION OF A MARBLED OR MOTTLED SOAP CAKE AND THE PRODUCT OF SUCH PROCESS

Jutta Trautvetter, Monchen-Gladbach; Albert Weingartz, Moers, and Lothar Werner, Krefeld, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed June 23, 1975, Ser. No. 589,795
Claims priority, application Germany, June 28, 1974, 2431048
Int. Cl.² B29C *9/00*
U.S. Cl. 252—134 **4 Claims**

1. A process for the production of a marbled or mottled soap cake or soap bar comprising the steps of extruding and forming a soap strand of the required dimensions, having axially aligned filaments or layers of a different color from the principal color therein, cutting said extruded strand of the required dimensions, having axially aligned filaments or layers of a different color from the principal color into stamping blanks of the desired dimensions, substantially parallel at an angle α of from 75° to 15° to the axis of said extruded strand, stamp molding said stamping blanks at an angle β of from 90° to 30° to the cut

surfaces of said stamping blank, and recovering a marbled or mottled soap cake or soap bar.

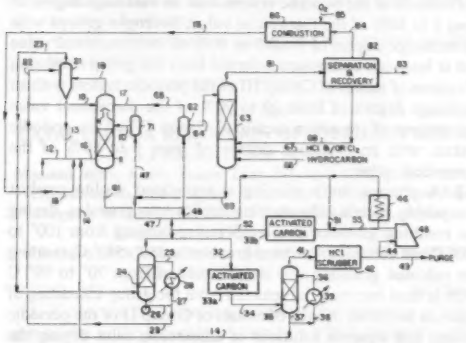


4. The marbled or mottled soap cake or soap bar produced by the process of claim 1 and having mottled filaments running radially from a center point not on the axis of symmetry to the periphery of said soap cake or soap bar.

4,036,776
RECOVERY OF CHLORINE VALUES FROM A MELT OXIDATION GAS

Herbert D. Riegel, Maplewood; Harvey D. Schindler, Fairlawn, and Vincent A. Strangio, Glenridge, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Feb. 10, 1976, Ser. No. 656,769
Int. Cl.[2] C01B 9/02
U.S. Cl. 252—187 R 9 Claims



1. In a process for oxidizing in an oxidation reaction zone a molten salt mixture containing a multivalent metal chloride in its higher and lower valence state by contacting the molten salt mixture with gaseous molecular oxygen and aqueous hydrogen chloride at a temperature of from 600° F to 900° F to produce an oxidized melt and recover chlorine values by enriching the higher valent multivalent metal chloride content of the molten salt mixture and recovering the molten salt from the oxidation reaction zone, the improvement comprising:

withdrawing from the oxidation reaction zone an effluent gas containing water vapor and chlorine, said chlorine being present in an amount up to the chlorine vapor pressure of the molten salt mixture;

cooling the effluent gas;

contacting the effluent gas in a chlorine separation zone with activated carbon to convert chlorine to hyrogen chloride, said contacting being effected at a temperature of from 100° F to 250° F and a pressure of from 15 to 100 psia;

Withdrawing from the chlorine separation zone a gas essentially free of chlorine and containing water vapor and hydrogen chloride produced from the chlorine;

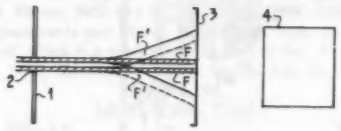
recovering aqueous hydrogen chloride from said gas; and

introducing recovered aqueous hydrogen chloride into said oxidation reaction zone.

4,036,777
ION CURRENT MEASURING ARRANGEMENT

Jean Claude Dubois, and Jean Jacques Le Goux, both of Courbevoie, France, assignors to Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.-E.C.A.), Courbevoie, France

Filed July 20, 1976, Ser. No. 707,067
Claims priority, application France, July 25, 1975, 75.23338
Int. Cl.[2] H01J 37/26, 39/36; G01N 27/62
U.S. Cl. 250—299 3 Claims



1. A mass spectrometry ion current measuring arrangement comprising: a diaphragm having a slot for momentarily letting through an ion beam; an electron multiplier having a first dynode located behind said slot; a measuring device for measuring the current supplied by said mutiplier; and means for acting on said beam after it has passed through said slot and before it reaches said dynode so as to expand, at least in the direction parallel to the width of said slot, the zone of said dynode struck by the ions of said beam in the course of at least each one of successive time intervals of duration Δt included in the time interval T during which the whole of said beam passes though said slot.

4,036,778
AQUEOUS, STORAGE-STABLE DISPERSIONS OF WATER-SOLUBLE COMPOUNDS

Frank Lohmann, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 6, 1976, Ser. No. 655,813
Claims priority, application Switzerland, Feb. 28, 1975, 2564/75
Int. Cl.[2] D06L 3/12; C09K 11/00
U.S. Cl. 252—301.21 5 Claims

1. An aqueous storage-stable dispersion of a water-soluble optical brightener, which dispersion is free from organic solvents, and which comprises

a. a water-soluble anionic or cationic organic optical brightener selected from triazinylamino-stilbenes, v-triazolyl-stilbenes, distyryl-biphenyls, stilbenyl-naphthotriazoles, benzoxazolyl-stilbenes, bis-benzoxazoles, bis-benzimidazoles, pyrazolines, naphthalimides, benzofurans and distyrylbenzenes,

b. at least one water-soluble salt consisting of the anion of an inorganic or organic, mono- or polybasic acid and the cation of an inorganic, mono- or polyacid base,

c. at least one organic stabilising agent based on
one or more nonionic water-soluble polymers,
one or more nonionic, surface active compounds, or
mixtures thereof, and

d. water,

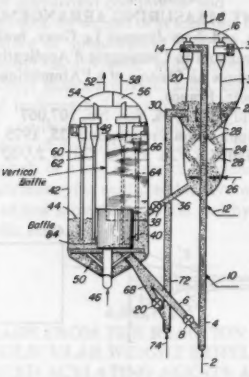
and wherein the salt concentration is high enough to insure that the water-soluble optical brightener remains essentially undissolved.

4,036,779

METHOD OF REGENERATING CATALYST IN A SWIRL TYPE REGENERATOR CONTAINING A DILUTE PHASE BAFFLE

Klaus W. Schatz, Philadelphia, Pa., and Paul W. Snyder, Jr., Pitman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,223
Int. Cl.[2] B01J *21/20, 29/38;* C10G *11/18*
U.S. Cl. 252—417 3 Claims



1. An improved hydrocarbon conversion catalyst regeneration operation in the presence of fluidizable catalyst particles comprising maintaining a fluid bed of catalyst particles circulating circumferentially in a regeneration zone, said bed comprising a dense phase and a dilute phase, said zone containing in the dense phase an annular section formed by a curved upwardly extending baffle spaced inwardly from the outer wall thereof, the improved method comprising:

introducing catalyst particles obtained from a hydrocarbon conversion operation after stripping thereof into said zone tangentially to said circulating bed of catalyst, the dilute phase of said zone having positioned therein a dilute phase baffle, extending from beneath the dense phase to the cyclone inlet and from the outer wall of the regenerator inwardly to about the center thereof,

passing regeneration gas upwardly through the circulating fluidized particles in said regeneration zone,

recovering gaseous products of regeneration from an upper portion of the regeneration zone, and

withdrawing regenerated catalyst from a lower section of said fluid bed of catalyst.

3. The method of claim 1 wherein the cyclone displegs between the catalyst outlet and inlet are reversed so that catalyst therefrom discharges tangentially to the circumferential circulation.

4,036,780

CATALYST FOR THE PREPARATION OF MALEIC ANHYDRIDE

Hideo Suzuki; Takahisa Sato; Tatsuo Kubota; Shigemi Osaka, and Shigeru Komatsu, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,746
Claims priority, application Japan, Dec. 2, 1974, 49-136995
Int. Cl.[2] B01J *27/14;* C07D *307/60*
U.S. Cl. 252—437 14 Claims

1. A catalyst for the preparation of maleic anhydride by vapor phase catalytic oxidation of benzene with a molecular oxygen containing gas consisting of a porous inert support selected from the group consisting of silicon carbide and alpha alumina having an alkali metal content, calculated as oxide, of at most 0.3% by weight and supported thereon a catalytic substance of a constituent composition consisting of (a) 1 mole of vanadium pentoxide, (b) 0.3 to 1.2 moles of molybdenum trioxide, (c) 0.005 to 0.05 moles of phosphorus pentoxide, (d) 0.03 to 0.2 moles of sodium oxide and (e) 0 to 0.05 moles of potassium oxide.

4,036,781

DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 515,328, Oct. 16, 1974, abandoned. This application July 7, 1975, Ser. No. 593,726
Int. Cl.[2] B01J *21/04, 21/10, 23/26, 27/02*
U.S. Cl. 252—439 3 Claims

1. A dehydrogenation catalyst consisting essentially of (1) magnesium chromite + selenium oxide, (2) magnesium chromite + selenium oxide + aluminum oxide, or (3) $MgAl_xCr_{2-x}O_4$ = selenium oxide wherein the ratio of Al:Cr is from 0.0004 to 1.2:1 and x is a number of from more than 0 up to less than 1.

4,036,782

GRANULATED ZEOLITE CATALYST AND PROCESS FOR PRODUCING THE CATALYST

Khabib Minachevich Minachev, Leninsky prospekt, 57, kv. 15; Evgeny Sergeevich Mortikov, Leninsky prospekt, 61/1, kv. 34, both of, Moscow; Alexandr Semenovich Leontiev, ulitsa Gagarina, 13, kv. 13, Bashkirskaya ASSR, Salavat; Tamara Stepanovna Papko, Leninsky prospekt, 67, kv. 54, Moscow; Alexei Alexeevich Masloboev-Shvedov, Nagatinskaya naberezhnaya, 16, kv. 75, Moscow, and Nikolai Fedorovich Kononov, ulitsa Garibaldi, 13/54 korpus 2, kv. 41, Moscow, all of U.S.S.R.

Filed Dec. 31, 1974, Ser. No. 537,764
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 Z 12 Claims

1. A granulated zeolite catalyst containing cations of metals of Group II of the periodic system with an exchange degree of from 5 to 50% of the theoretical value, hydrogen groups with an exchange degree of from 5 to 50% of the theoretical value and at least one component selected from the group consisting of cations of metals of Group III of the periodic system with an exchange degree of from 20 to 90% of the theoretical value and cations of transition metals of Group IV of the periodic system with an exchange degree of from 9 to 80% of the theoretical value.

2. A process for producing a granulated zeolite catalyst comprising forming the starting zeolite into granules, drying the resulting granules at a temperature ranging from 100° to 150° C and calcining the dried granules at 380°–550° C; treating the calcined granules at a temperature of from 70° to 90° C with at least one material selected from the group consisting of aqueous solutions of salts of metals of Group II of the periodic system and aqueous solutions of ammonium salts; drying the treated granules at a temperature of from 120° to 150° C and calcining the dried granules at a temperature of from 380° to 550° C; treating the granules resulting from the second calcination with at least one component selected from the group consisting of aqueous solutions of salts of metals of Group III of the periodic system and aqueos solutions of salts of transition metals of Group IV of the periodic system at a temperature of from 40° to 90° C; in the case of treating the granules resulting from the first calcination with aqueous solutions of ammonium salts, the granules resulting from the second calcination, in addition to being treated with said at least one component, are also treated with aqueous solutions of salts of metals of Group II of the periodic system; and drying the granules resulting from said operations at a temperature of from 120° to 150° C and calcining the dried granules at a temperature of from 380° to 550° C.

4,036,783

SUPPORTED CATALYST CONTAINING VANADIUM AND TITANIUM

Kurt Blechschmitt, Schifferstadt; Peter Reuter, Bad Duerkheim; Friedrich Wirth, Ludwigshafen; Gert Buerger, Mannheim, and Rolf Seubert, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 25, 1976, Ser. No. 661,241
Claims priority, application Germany, Mar. 13, 1975, 2510994
Int. Cl.[2] B01J *21/06, 23/22, 35/02*
U.S. Cl. 252—461 3 Claims

1. A supported catalyst comprising an inert, non-porous ring-shaped carrier which has an external diameter of from 7.3 to 8.6 mm, a length of from 5.3 to 7.0 mm and a wall thickness of from 0.1 to 2 mm, and a layer of from 0.05 to 1 mm of an active composition consisting essentially of from 1 to 30 percent by weight of vanadium pentoxide and from 70 to 99 percent by weight of titanium dioxide, applied to the carrier.

4,036,784

METHOD OF PRODUCING AN EXTRUDED CATALYST COMPOSITION

Stanley A. Gembicki, Western Springs, Ill., and Stefan H. Aeschbach, Forch, Switzerland, assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 582,522, May 30, 1975, abandoned. This application Sept. 10, 1976, Ser. No. 722,319
Int. Cl.[2] B01J *23/16, 23/24, 21/00*
U.S. Cl. 252—465 17 Claims

1. An extruded composition prepared by the method which comprises:

a. admixing a finely divided refractory inorganic oxide, a peptizing agent and sufficient water to produce a mixture characterized by a weight loss on ignition at 900° C. of from about 50 to about 70%;

b. maintaining said mixture under shear-mixing conditions, the intensity of said shear-mixing being characterized by an energy input equivalent to from about 15 to about 120 watt-hours per pound of dry refractory inorganic oxide contained in said mixture over a period of from about 0.5 to about 5 minutes;

c. extruding the resulting dough and drying and calcining the extrudate.

4,036,785

CATALYST FOR REDUCTION OF NITROGEN OXIDES IN PRESENCE OF AMMONIA

Masumi Saito, Kobe; Sumio Tani, Neyagawa; Shigeaki Matsui, Higashiosaka, and Shigeaki Kasaoka, Okayama, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Aug. 3, 1976, Ser. No. 711,184
Claims priority, application Japan, Aug. 4, 1975, 50-95231
Int. Cl.[2] B01J *21/06, 23/74*
U.S. Cl. 252—472 16 Claims

1. A process for preparing a catalyst for reduction of nitrogen oxides in the presence of ammonia which comprises treating titanium slag having an iron content of about 2 to 8% by weight in terms of FeO on the basis of the weight of the titanium slag with sulfuric acid at a temperature not lower than about 100° C., drying and calcining the resultant product.

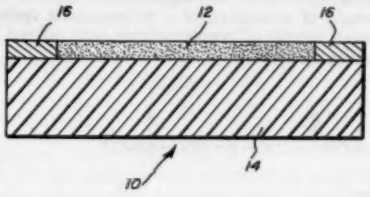
4,036,786

FLUORINATED CARBON COMPOSITION AND RESISTOR UTILIZING SAME

William H. Tiedemann, Cedarburg, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 26, 1976, Ser. No. 670,985
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—511 23 Claims

3. A composite, electrical resistive element composition characterized by high resistivity, stable temperature coefficient of resistivity, linear voltage response and minimal current noise which comprises a current-conductive component of partially fluorinated carbon having the empirical formula CG_x wherein



x has a value of up to 0.2 and an inert, nonreactive, non-conductive binder-filler.

4,036,787

PROCESS FOR THE PRODUCTION OF EPOXY SILICATE COMPOUNDS AND POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 612,844, Sept. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 262,485, June 14, 1972, abandoned. This application Apr. 19, 1976, Ser. No. 678,196
Int. Cl.[2] C08G *77/02*
U.S. Cl. 260—2 S 10 Claims

1. The process for the production of epoxy silicate polymers by the following steps:

a. adding about 10 parts by weight of a silicic acid gel;

b. mixing therewith 5 to 20 parts by weight of an organic epoxy compound havng at least one epoxy group;

c. mixing therewith a catalytic amount of organic amine compounds; and

d. agitating the mixture until the resulting chemical reaction is complete.

4,036,788

ANIONIC HYDROGELS BASED ON HETEROCYCLIC N-VINYL MONOMERS

Robert Steckler, Del Mar, Calif., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

Filed Feb. 11, 1975, Ser. No. 549,095
Int. Cl.[2] C08F *220/20*
U.S. Cl. 260—2.1 E 10 Claims

1. The anionic, polymeric hydrogel produced by simultaneous polymerization and cross-linking in the presence of a free radical polymerization catalyst in an amount of from about 0.05 to about 4 weight percent, based on the total weight of monomers, and at a temperature of from about 20° C. to about 125° C., of a mixture consisting essentially of the following monomers:

a. about 20 to about 95 weight percent, based on the total weight of monomers, of a heterocyclic N-vinyl monomer selected from the group consisting of N-vinyl lactams, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone and N-vinyl imidazole;

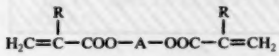
b. about 50 to 0.05 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated anionic monomer, capable of copolymerizing with (a), and which contains in its molecular structure a sulfonic acid group and is selected from the group consisting of acrylamido aryl sulfonic acids, acrylamido alkyl sulfonic acids, glycidyl acrylate sulfonic acid, glycidyl methacrylate sulfonic acid, and esters of α-methylene carboxylic acids with hydroxysulfonic acids which esters have the formula: R″ — COO — Q — SO_3M, wherein

R″ represents a member of the group consisting of vinyl and α substituted vinyl,

Q represents a divalent hydrocarbon radical havig its valence bonds on different carbon atoms, and

M is a cation;

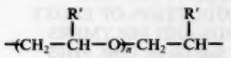
c. about 0.2 to about 12 weight percent, based on the total weight of monomers, of a polymerizable cross-linking agent, capable of copolymerizing with (a) and (b) and having the formula:



wherein

R represents a member of the group consisting of hydrogen and alkyl of from about 1 to about 4 carbon atoms;

A represents alkylene of from 2 to about 10 carbon atoms or a polyglycol ether group of the formula:



in which

R′ represents a member of the group consisting of hydrogen and alkyl of 1 to 2 carbon atoms, and

n represents an integer of from 1 to about 20; and

d. from 0 to about 50 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated acrylic monomer capable of copolymerizing with (a), (b) and (c) and capable of polymerizing to a high molecular weight, in excess of 100,000, and selected from the group consisting of acrylamides, methacrylamides, acrylonitrile, methacrylonitrile, alkyl acrylates and methacrylates, and monohydroxy and monoalkoxy polyalkylene glycol acrylates and methacrylates; and

provided that (a) ≧ (d) and (a) + (d) = about 40 to about 95 weight percent.

4,036,789

POLYURETHANE FOAMS PREPARED FROM MIXED POLYALKYLENE GLYCOL POLYPHOSPHOROUS COMPOUNDS

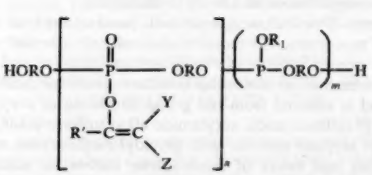
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 389,608, Aug. 20, 1973, Pat. No. 3,878,270, which is a division of Ser. No. 166,289, July 26, 1971, Pat. No. 3,798,290, which is a continuation-in-part of Ser. No. 86,313, Nov. 2, 1970, Pat. No. 3,819,750, which is a continuation-in-part of Ser. No. 63,262, Aug. 6, 1970, abandoned. This application Nov. 19, 1974, Ser. No. 525,239

Int. Cl.[2] C08G *18/14*

U.S. Cl. 260—2.5 AR **2 Claims**

1. A flame retardant polyurethane foam containing, as a chemically bonded integral part thereof, the residue of a polyalkylene glycol polyphosphorus compound having the formula:



wherein the amount of said compound is from about 5 to 30 percent by weight of said foam and R is a polyalkylene glycol residue defined as that portion remaining after two hydroxyl groups have been removed from a polyalkylene glycol having the formula:

wherein R″ is an alkylene group of from 2 to about 20 carbon atoms, which is straight chain, branch chain or a mixture thereof, and *x* designates the number of repeating alkylene ether units and is from 2 to about 20; R_1 is a C_1–C_{10} alkyl residue; R′ is selected from the group consisting of hydrogen, C_1–C_4 alkyl, and C_1–C_4 haloalkyl; Y and Z are each selected from the group consisting of hydrogen, halogen, and C_1–C_4 alkyl; and *m* and *n* are numbers in the range from 1 to about 25 such that the sum of *m* and *n* is in the range from about 2 to about 50.

4,036,790

POLYURETHANE FOAM COMPOSITIONS

Francis D. Thomson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 8, 1975, Ser. No. 575,897

Int. Cl.[2] C08G *14/08, 18/28*

U.S. Cl. 260—2.5 AQ **12 Claims**

1. A polyurethane foam composition prepared by a process which comprises reacting an organic polyisocyanate or a polyisocyanate prepolymer with a resin mixture comprising a first polyol formed by reacting an alkylene oxide with a resole, said resole being formed in the presence of an alkaline catalyst by the reaction of phenol, urea and aldehyde.

4,036,791

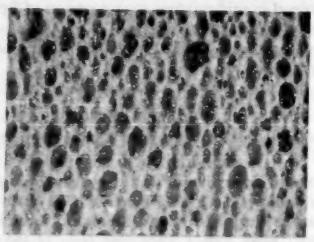
SIMULATED NATURAL SPONGE FROM URETHANE

James Leverette Guthrie, Ashton, and Donald John Bach, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 15, 1975, Ser. No. 577,969

Int. Cl.[2] C08G *18/06, 18/08, 18/14*

U.S. Cl. 260—2.5 AG **8 Claims**



1. A method for preparation of new improved hydrophilic crosslinked polyurethane foams which simulate natural sponges which comprises reacting a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, said polyol being substantially void of reactive hydroxy groups and having a molecular weight of from about 200 to about 20,000, with a second component comprising aqueous reactant, the ratio of moles H_2O/moles NCO groups being about 6.5 to about 390 in said second and first components respectively, in the presence of a liquid defoaming agent and nonionic surfaceactive agent, the nonionic surface-active agent having a high hydrophilic / lyophilic balance in the range of about HLB 14 to about HLB 18, whereas the liquid defoaming agent has a low hydrophilic / lyophilic balance of about HLB 5.5 to about HLB 8, and wherein the concentration of the liquid defoaming agent in the aqueous water phase prior to the foaming reaction is from about 0.3 to about 3.0% by weight of the aqueous phase, and the concentration of the nonionic surface-active agent in the aqueous water phase prior to the foaming reaction is from about 0.05 % to about 0.3% by weight of the aqueous phase.

4,036,792
POLYISOCYANURATE FOAMS PREPARED BY A COCATALYST SYSTEM

Henry S. Hopkins, Jr., Ashland, Ohio, assignor to General Latex and Chemical Corporation, Cambridge, Mass.

Filed July 16, 1975, Ser. No. 596,367
Int. Cl.[2] C08G *18/18*
U.S. Cl. 260—2.5 AW **20 Claims**

1. In the process of preparing a polyisocyanurate product, which process comprises reacting a polyisocyanate in the presence of a catalytic amount of a trimerization catalyst to provide a polyisocyanurate, the improvement which comprises:

carrying out the reaction in the presence of a trimer cocatalyst system which comprises from about 1 to 15 percent by weight of the product of a dialkylaminoalkyl phenol trimerization catalyst, and from about 1 to 15 weight percent of the dialkylaminoalkyl phenol of a tri C_2–C_3 alkylene diamine to provide a polyisocyanurate of immproved friability properties.

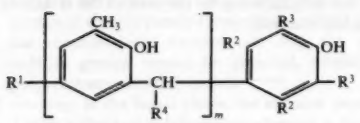
4,036,793
PHENOLIC POLYMER, RELATED PRODUCTS AND PROCESSES THEREOF

Ernest K. Moss, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 509,565, Sept. 27, 1974, which is a division of Ser. No. 354,636, April 26, 1973, Pat. No. 3,876,620. This application Sept. 17, 1975, Ser. No. 614,087
Int. Cl.[2] C08J *9/14*
U.S. Cl. 260—2.5 F **20 Claims**

1. A cellular material comprising the reaction product of:

A. an alkylol group containing phenolic polymer of claim **1** of Formula I:

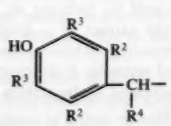


(I)

wherein:

a. R^1 is

hydrogen or a radical of Formula II:



(II)

b. the R^2's are independently selected from the group consisting of lower alkyl, phenyl, benzyl, halo, nitro and hydrogen,

c. the R^3's are independently selected from the group consisting of

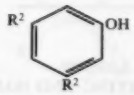
hydrogen, or a radical of Formula II,

d. the R^4's are independently selected from the group consisting of lower alkyl, hydrogen, phenyl, benzyl, or furyl,

e. *m* is an integer from 2 to 10 inclusive,

f. the phenolic polymer has a molecular weight between 200 and 2000, and

B. a compound of Formula V:



(V)

wherein the weight ratio of B:A is 1:30 to 1:2.

4,036,794
MANUFACTURE OF EXPANDABLE STYRENE POLYMERS

Hans Georg Keppler, Weinheim; Erhard Stahnecker, Heidelberg, and Rolf Moeller, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Oct. 8, 1976, Ser. No. 730,826
Claims priority, application Germany, Oct. 30, 1975, 2548524
Int. Cl.[2] C08J *9/20*
U.S. Cl. 260—2.5 B **9 Claims**

1. In a process for the manufacture of expandable polystyrene particles by suspension polymerization of styrene, with or without a minor amount of one or more other monomers, in the presence of a blowing agent and a suspension stabilizer, the blowing agent being added during or after the polymerization, wherein the suspension polymerization is carried out in the presence of a suspension stabilizer, the improvement wherein the suspension stabilizer has been manufactured by free radical polymerization, in the aqueous phase, of from 90 to 10 parts by weight of styrene, a substituted styrene, an ester of acrylic acid or methacrylic acid with an alcohol of 1 to 8 carbon atoms, a vinyl ester of a saturated monocarboxylic acid of 2 to 12 carbon atoms, a nitrile or amide of acrylic acid or methacrylic acid, vinyl chloride, butadiene or a mixture of two or more thereof, in the presence of from 10 to 90 parts by weight of polyvinylpyrrolidone or of a copolymer of vinylpyrrolidone in which polymerized units of the latter predominate.

4,036,795
AQUEOUS CATIONIC COATING FROM AMINE-EPOXY ADDUCT, POLYAMIDE, AND SEMIBLOCKED POLYISOCYANATE, ACID SALT

Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed Sept. 11, 1975, Ser. No. 612,281
Claims priority, application Japan, Sept. 20, 1974, 49-109382
Int. Cl.[2] C08J *3/06*; C08L *63/02*; C25D *13/06*
U.S. Cl. 260—18 PN **10 Claims**

1. A cationic electroporetic coating composition comprising an aqueous medium and a resinous binder dispersed therein, said resinous binder being prepared by contacting at least one starting material with a partially blocked polyisocyanate compound at a temperature of 40° to 130° C in the weight ratio of

from 5 to 9 of the former to from 5 to 1 of the latter, and subsequently by neutralizing the resulting product with an acid, said starting material being at least one selected from the group consisting of:

1. a mixture of a reaction product prepared by reacting an epoxy resin with a basic amino compound having at least one basic amino group, and a polyamide having at least one basic amino group, in the weight ratio of from 1 to 9 of the reaction product to from 9 to 1 of the polyamide, and
2. a further reaction product prepared by mixing said reaction product with said polyamide at a temperature of 50° to 200° C in the weight ratio of from 1 to 9 of the reaction product to from 9 to 1 of the polyamide,

said partially blocked polyisocyanate compound having at least one blocked isocyanate group in the molecule and an average of more than zero to not more than one free isocyanate group per molecule.

4,036,796

PROCESS OF DRYING AND HARDENING FILM-FORMING MATERIAL

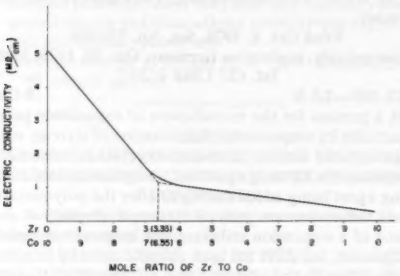
Iwakichi Sugiyama, Narashino; Yukihisa Takaoka, Ibaraki, and Kiyoshi Endo, Chiba, all of Japan, assignors to Matsumoto Seiyaku Kogyo Kabushiki Kaisha, Ichikawa, Japan

Filed Jan. 29, 1975, Ser. No. 545,314

Claims priority, application Japan, Jan. 29, 1974, 49-12058

Int. Cl.[2] C08L *91/00*; C09F *9/00*

U.S. Cl. 260—22 CA **9 Claims**



1. A process of drying and hardening a film-forming material which comprises using as a dryer for said film-forming material as alkoxy-radical containing zirconium compound-cobalt carboxylate complex, said alkoxy radical-containing zirconium compound being selected from the group consisting of zirconium tetraalkoxides of the formula:

$$Zr\ (OR)_4$$

wherein R denotes an alkyl radical having from 2 to 10 carbon atoms and may be of the same kind or of different kinds, and zirconium alkoxychelates of the formula:

$$Zr\ (L)_n\ (OR)_m$$

wherein R denotes the same radical as defined above, L denotes a chelating ligand selected from the group consisting of β-diketones, hydroxy esters, and ketoesters, and m and n are integers each of 1 to 3, m plus n equaling 4, the cobalt carboxylate being a member selected from the group consisting of cobalt salts carboxylic acid having from 6 to 18 carbon atoms, the mole ratio of cobalt to zirconium of said complex being of the order of 2 : 1.

4,036,797

POLYURETHANE PRECURSORS CONTAINING THIXOTROPIC AGENTS

Arthur L. Meader, Jr., Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 10, 1973, Ser. No. 396,040

Int. Cl.[2] C08L *95/00*

U.S. Cl. 260—28 R **11 Claims**

1. A composition comprising:

A. 18 to 50 weight percent of a polyurethane precursor, said precursor comprising:

1. a polyol having a molecular weight of 1500 to 5000, and
2. a chain stiffener having a molecular weight of 62 to 300, wherein the mole ratio of the isocyanate-reactive groups of said low molecular weight chain stiffener to the isocyanate-reactive groups of said polyol is 0.5–4:1,

B. 80 to 30 weight percent of a substantially inert, nonvolatile extender, selected from the group consisting of cutback asphalts, mineral oils, and mixtures thereof,

C. 0.1 to 8 weight percent of a thixotropic agent formed in situ by reacting a mixture of primary mono and diamines wherein the monoamine is a monofunctional monoamine containing 6 to 30 carbon atoms and the diamines are selected from the group consisting of a methyl imine bis(propylamine), ethylene diamine and mixtures thereof, wherein the mol ratio of monoamines to diamines is 20–1:1 diamines, and a polyisocyanate at an NCO/NH ratio of 0.10–1.3:1, and

D. 0 to 20 weight percent of an inert filler.

4,036,798

HARDENABLE COMPOSITIONS OF IMPROVED THERMAL STABILITY

Walter Hoppe, Windeck-Schladern; Hans Junger, Troisdorf, and Franz Weissenfels, Siegburg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Feb. 3, 1975, Ser. No. 546,832

Claims priority, application Germany, Feb. 14, 1974, 2406992

Int. Cl.[2] C08K *3/40*

U.S. Cl. 260—28 P **17 Claims**

1. A composition comprising an inorganic oxidic material other than glass powder and 1 to 30 weight percent of glass powder having a particle size of >0 to 100 microns and 1 to 20 weight percent, of a hardenable thermo- or cold-setting phenolic resin, the weights being on the basis of the weight of the inorganic oxidic material.

4,036,799

COMPOSITIONS CONTAINING POLYCHLOROPRENE

Peter Henry Westermann, Dorking, England, assignor to The British Petroleum Company Limited, London, England

Filed Feb. 26, 1976, Ser. No. 661,606

Claims priority, application United Kingdom, Mar. 7, 1975, 9564/75

Int. Cl.[2] C08L *91/00*; C08F *14/02*; C08C *19/20*

U.S. Cl. 260—28.5 B **16 Claims**

1. A vulcanizable composition comprising polychloroprene and 3 to 300 parts by weight, per 100 parts of polychloroprene of hardened extract obtained by blowing air at an elevated temperature into a solvent extract of a distillate petroleum fraction boiling in the lubricating oil boiling range and containing a major proportion of aromatic hydrocarbons, said hardened extract having a saturated hydrocarbon content of not more than 10% by weight.

4,036,800

ELECTRODEPOSITION OF AQUEOUS DISPERSIONS OF AMINE FUNCTIONAL URETHANE COPOLYMERS

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed June 4, 1975, Ser. No. 583,655
Int. Cl.[2] C08K 3/18; C08L 61/20, 75/04
U.S. Cl. 260—29.2 TN 23 Claims

1. An amine functional urethane copolymer dispersible in water with the aid of a solubilizing acid and which is a copolymer of:

A. 5–75% by weight of an ethylenically unsaturated urethane amine free of epoxy groups and formed by reacting a 1,2-epoxy functional urethane in which the urethane groups are ethylenically unsaturated with a monosecondary amine; and

B. the balance consisting essentially of copolymerizable monoethylenically unsaturated monomers.

4,036,801

AQUEOUS AMPHOTERIC POLYURETHANE HAVING BLOCKED NCO GROUPS AND PROCESS

Kazuo Matsuda; Hidemasa Ohmura, and Takeyo Sakai, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 14, 1976, Ser. No. 705,267
Claims priority, application Japan, July 31, 1975, 50-93327
Int. Cl.[2] C08G 18/80; C08J 3/06
U.S. Cl. 260—29.2 TN 6 Claims

1. A process for preparing an aqueous amphoteric thermosetting polyurethane emulsion, which comprises:

1. reacting, in the liquid phase and in a ketone solvent, at a temperature of from −20° to +70° C, (A) isocyanate-terminated urethane prepolymer prepared by reacting organic polyhydroxyl component havin a molecular weight in the range of from 200 to 10,000 with an excess of organic polyisocyanate, with (B) an excess of polyalkylene polyamine having at least two primary or secondary amino groups, the total mole number of primary and secondary amino groups in the polyalkylene polyamine being greater than the total mole number of isocyanate groups in the isocyanate-terminated urethane prepolymer, the reaction being carried out until the presence of —NCO groups cannot be detected, whereby to form polyurethane-urea-polyamine,
2. reacting, in the liquid phase, the reaction product of step 1 with a blocked polyisocyanate having a single free isocyanate group in the molecule, at a temperature of −20° C to +70° C, for about 0.5 to 2 hours,
3. reacting the reaction product of step 2 with either (I) a compound selected from the group consisting of 1,3-propane sultone, 1,4-butane sultone, β-propiolactone, γ-butyrolactone, ϵ-caprolactone, δ-valerolactone and a compound having the formula $X(CH_2)_nCOONa$, wherein X is halogen and *n* is one or 2, or (II) a compound selected from the group consisting of methyl acrylate, ethyl acrylate, methyl methacrylate, ethyl methacrylate and acrylonitrile, followed by hydrolysis of the reaction product, whereby to render amphoteric the reaction product of step 2, p1 4. adding water to the reaction product of step 3, and
5. treating the product of step 4 to remove the organic solvent therefrom and thereby obtaining an aqueous polyurethane emulsion as a final product.

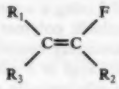
4,036,802

TETRAFLUOROETHYLENE COPOLYMER FINE POWDER RESIN

Robert Victor Poirier, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 24, 1975, Ser. No. 616,442
Int. Cl.[2] C08L 27/18
U.S. Cl. 260—296 F 21 Claims

1. An aqueous polymer dispersion comprising a dispersion of non-melt-fabricable tetrafluoroethylene polymer particles in water at a solids content of between about 10 and about 65 weight percent; said particles having an average size of between about 0.1 and 0.5μ; said particles having at least two portions, an outer portion and an adjacent inner portion, each portion consisting essentially of a copolymer of units of tetrafluoroethylene and at least one comonomer having the formula

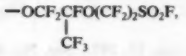

(a)

wherein

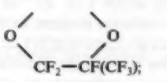
R_1 independently if F or H;

R_2 independently is F or Cl;

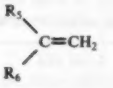
R_3 can be Cl, $—R_F$, $—OR_F$, $—R'_FH$, $—OR'_FH$, $—R'_FCl$, $—OR'_FCl$, or



Wherein R_F is linear perfluoroalkyl of 1–5 carbon atoms, and R'_F is linear perfluoroalkylene (perfluorinated alkane diradical) of 1–5 carbon atoms in which the designated substituent is an omega substituent; and when R_2 is F, R_1 and R_3 taken together can be



or the formula


(b)

wherein

R_5 and R_6 are independently $—CF_3$ or $—CClF_2$; said inner copolymer portion containing a higher percentage of said comonomer than the outer copolymer portion; the total comonomer content present in the particle, the amount of comonomer present in the copolymer of each portion, and the amount of each portion within such particles being sufficient to produce on AWG 22 wire a sintered coating having no more than 5 flaws per 100 meters of coated wire when said particles are paste extruded at a reduction ratio of 2840:1, the flaws being detected by subjecting the sintered coated wire to a high voltage spark tester at 2KV and 3000Hz; the copolymers of the inner portion and the outer portion combined containing an amount of comonomer which is low enough to maintain the non-melt-fabricable nature of the polymer particles.

4,036,803
PROCESS FOR PRODUCING FLAME RETARDANT ACRYLIC SYNTHETIC FIBERS

Toshiyuki Kobashi, and Kenichi Masuhara, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Nov. 11, 1975, Ser. No. 630,890
Claims priority, application Japan, Nov. 14, 1974, 49-131832
Int. Cl.[2] C08L *33/20*
U.S. Cl. 260—29.6 AN **9 Claims**

1. In a process for the production of a flame retardant acrylic synethic fiber by making a spinning solution composed of an inorganic solvent solution of an acrylonitrile polymer with an emulsion of a polymer of a vinyl halide and/or vinylidene halide, and wet spinning the resulting mixed solution, the improvement which comprises using, as said emulsion, an emulsion obtained by polymerizing a vinyl halide and/or vinylidene halide, or a mixture of such monomers with other unsaturated monomers copolymerizable therewith, in an aqueous medium below a pH of 4 using a water-soluble cataylst, in the presence of a water-soluble polymer containing copolymerized monomer units consisting essentially of an ethylenically unsaturated carboxylic acid or a salt thereof and monomer units consisting of an ethylenically unsaturated sulfonic acid or a salt thereof, the ratio of monomeric units of ethylenically unsaturated carboxylic acid or its salt to monomeric units of ethylenically unsaturated sulfonic acid or its salt being 30–80 : 70–20 in weight ratio.

4,036,804
ADHESIVE COMPOSITION

Seizaburo Hirai, Takatsuki; Yoji Mizoe, Kyoto, and Itoh Koji, Amagasaki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 11, 1975, Ser. No. 603,629
Claims priority, application Japan, Aug. 12, 1974, 49-92648
Int. Cl.[2] C08L *11/02, 13/02*
U.S. Cl. 260—29.7 SQ **8 Claims**

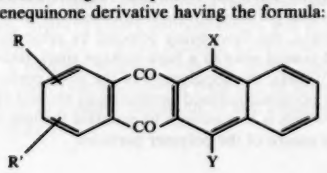
1. An adhesive resinous composition for bonding an unvulcanized rubber material onto a metal substrate which comprises (1) an aqueous solution or dispersion of an elastic high molecular weight compound having carboxyl groups in its structure in such amounts that the carboxyl groups are present in amounts of from about 1×10^{-4} to 40×10^{-4} mol per 1 gram of the total resinous content in the composition, (2) a vulcanizing agent in an amount of 0.1 to 10% by weight, based on the weight of the elastic high molecular weight compound and (3) a vulcanizing accelerator to adjust the vulcanization rate of the adhesive composition to that of the unvulcanized rubber in an amount of 0.1 to 10% by weight of the elastic high molecular weight compound; wherein the resinous solid content is present in an amount of from about 1–50% by weight, based on the weight of the adhesive composition.

4,036,805
COLORING OF THE ORGANIC MATERIALS WITH NAPHTHACENEQUINONES

Michihiro Tsujimoto, Tachikawa, and Ichiro Okubo, Hachioji, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,482
Claims priority, application Japan, July 28, 1972, 47-75044
Int. Cl.[2] C08L *77/02, 67/02, 23/08;* **D08P** *1/20*
U.S. Cl. 260—37 N **8 Claims**

1. A method which comprises coloring a synthetic organic high molecular weight compound or cellulose ester with a naphthacenequinone derivative having the formula:



wherein:

X is hydroxyl and Y is hydrogen, chlorine, hydroxyl, lower alkoxy *or lower alkoxy* the alkyl group of which *is* substituted with lower alkoxy or lower alkylthio, phenoxy *or phenoxy* which *is* substituted with methyl *or* methoxy, amino, phenylsulfonylamino *or phenylsulfonylamino* the phenyl group of which *is* substituted with lower alkyl, phenylamino, methyl, cyclohexyl or benzyl, *or X and Y each is simultaneously amino or phenylamino;* and

R and R' each is hydrogen, chlorine *or* methyl, or R and R' together form a benzene ring.

4,036,806
MOLDING COMPOUNDS

Kevin M. Foley, Toledo; Reuben H. Bell, Cincinnati, and Frank P. McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 8, 1975, Ser. No. 620,524
Int. Cl.[2] C08K *3/30*
U.S. Cl. 260—37 N **13 Claims**

1. A molding composition comprising a mixture of a nylon resin and at least one organic cement, wherein the resin is formed in the presence of the cement and wherein the resin and cement have a weight ratio of resin to cement ranging from 1:9 to 9:1 bases on the dry weight of cement and the weight of the resin solids wherein the cement is hydrated or hydraulic cement.

4,036,807
FLUORINE-CONTAINING ORGANOSILICON COMPOUNDS

John Heathcote Atherton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 339,764, March 12, 1973, Pat. No. 3,859,320. This application Sept. 24, 1974, Ser. No. 509,026
Claims priority, application United Kingdom, May 22, 1972, 23888/72
Int. Cl.[2] C08K *9/06*
U.S. Cl. 260—42.15 **4 Claims**

1. A method of preparing a filled fluorocarbon polymer from a filler and a granular fluorocarbon polymer, both in powder form, comprising treating the filler with a fluorocarbon derivative and agglomerating the filler together with the polymer from an aqueous medium, recovering the drying the agglomerate, the fluorocarbon derivative being an organosilicon compound of the general formula:

$$\left[C_nF_{2n^-}{}_1R_aC_mH_{2m}SiR'_bX_cO_{\frac{3-b-c}{2}}\right]_x\left[Z_dH_eSiO_{\frac{4-d-e}{2}}\right]_y$$

where R is a divalent group selected from the group consisting of oxygen, alkylene groups having not more than 8 carbon atoms, polyoxyalkylene diol residues, phenyleneoxy groups and phenyleneoxy groups containing substituents selected from the group consisting of lower alkyl and alkoxy groups and halogen atoms and in the case where R is a phenyleneoxy or a substituted phenyleneoxy group, the group R being optionally linked to the group C_mH_{2m} via a group selected from the group consisting of sulphonamido and carboxyl groups, R^1 is selected from the group consisting of methyl and phenyl groups, X is selected from the group consisting of halogen atoms, lower alkoxy groups, substituted lower alkoxy groups and polyoxyalkylene groups, Z is selected from the group consisting of lower alkyl groups and phenyl, *a* is 0 or 1, *b* is 0, 1 or 2, *c* is 0, 1, 2, or 3, $b + c$ is not greater than 3, *d* is 0, 1, 2 or 3, *e* is 0 or 1 and $d + e$ is not greater than 3, *n* is 8, 10 or 12,

m is 2, 3 or 4, x is a positive integer, when $b + c$ is 3, y is 0, and when $b + c$ is not greater than 2, y is a positive integer.

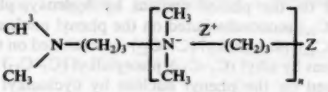
4,036,808

CONDUCTIVE HYDROGEL CONTAINING 3-IONENE

Alan Rembaum, and Shiao-Ping Siao Yen, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 280,649, Aug. 14, 1972, Pat. No. 3,898,188. This application Dec. 26, 1973, Ser. No. 427,917
Int. Cl.[2] C08L *29/04, 79/02*
U.S. Cl. 260—42.51 7 Claims

1. A conductive composition consisting essentially of a dispersion of 20 to 95 percent by weight of a water-soluble gel forming binder polymer selected from polyvinyl alcohol or polyvinyl alcohol cross-linked to a water-insoluble and water-swellable form by reaction with a coreactive water-soluble polymer and a linear, water-soluble polyelectrolyte of the formula:



where Z is chloro, bromo or iodo and n is an integer such that the intrinsic viscosity, n, as determined by light scattering in 0.4 KBr is at least 0.2 dl/g as determined by the formula:

$$n = (2.94 \times 10^{-4})\, M^{0.61}$$

where M is molecular weight.

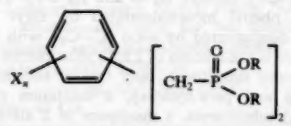
4,036,809

HALOGEN-CONTAINING DIPHOSPHONATES

Kestutis A. Keblys, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 549,518, Feb. 13, 1975, abandoned, which is a division of Ser. No. 351,809, April 16, 1973, abandoned. This application Oct. 2, 1975, Ser. No. 618,890
Int. Cl.[2] C08K *5/53*
U.S. Cl. 260—45.7 P 3 Claims

1. As a composition of matter, an unsaturated polyester resin stabilized with a flame retardant amount of a compound having the formula



wherein X is bromine, n is 2–4, and each R is alike or different and selected from lower hydrocarbyl groups and, said resin being prepolymer, made by esterification of dihydric alcohol with an acid moiety selected from unsaturated and saturated dicarboxylic acids and anhydrides, crosslinked with an unsaturated monomer.

4,036,810

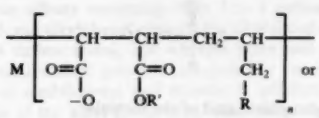
HALOGEN CONTAINING POLYMERIC RESINS HAVING HEAT AND LIGHT STABILITY

George C. Hopkins, Clarence, N.Y., and D. Bruce Merrifield, Houston, Tex., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

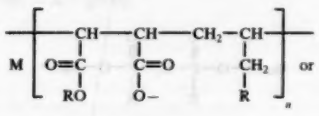
Continuation-in-part of Ser. No. 430,115, Jan. 2, 1974, Pat. No. 3,933,740. This application Nov. 14, 1975, Ser. No. 631,966
The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.
Int. Cl.[2] C08K *5/32, 5/11, 5/09*
U.S. Cl. 260—45.75 W 7 Claims

1. A heat and light stable polymer composition comprising a vinyl polymer containing more than 5 weight percent halogen substituent and a stabilizing amount of a metal salt of a polymeric reaction product of an alpha-olefin and maleic anhydride, said metal salt having recurring units of the formula:

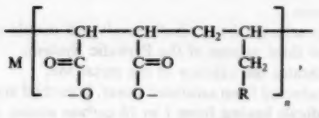
(A)



(B)

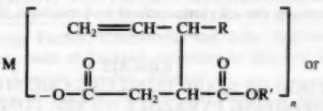


(C)

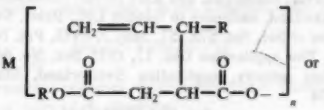


or a metal monomeric organic carboxylate salt represented by the formula:

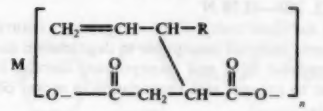
(D)



(E)



(F)



or mixtures thereof wherein M represents a di- or tetravalent metal selected from the group consisting of calcium, zinc, cadmium, barium and tin; n is 1 or 2 in formulas (C) and (F) and 2 or 4 in formulas (A), (B), (D), and (E); R is selected from the group consisting of hydrogen, aryl, alkyl, aralkyl, alkaryl and substituted derivatives thereof having 1 to 17 carbon atoms which can be halogenated; and R′ is selected from the group consisting of alkali metal cations, ammonium cation, lower alkyl-substituted ammonium cations, hydrogen atom, aryl radicals, alkyl radicals, aralkyl radicals alkaryl radicals and

substituted derivatives of said radicals having 1 to 17 carbon atoms which can be halogenated.

4,036,811

FLAME RETARDING POLYAMIDE MOLDING COMPOSITIONS

Siegfried Noetzel, Kelkheim, Taunus, and Walter Herwig, Neuenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

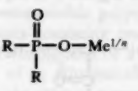
Filed Oct. 6, 1975, Ser. No. 620,141

Claims priority, application Germany, Oct. 7, 1974, 2447727

Int. Cl.[2] C08K 5/53

U.S. Cl. 260—45.75 W **7 Claims**

1. A polyamide molding composition consisting essentially of a polyamide and a flameproofing amount of a flame-proofing agent which is a salt of a phosphinic acid of the formula



I

or a diphosphinic acid of the formula

II

wherein

Me is selected from alkali metals and metals of the second and third groups of the Periodic System,

n indicates the valency of the metal Me,

R is selected from saturated linear, branched and cyclic alkyl radicals having from 1 to 16 carbon atoms, aryl and aralkyl radicals having from 6 to 16 carbon atoms and mixtures thereof, and

R_1 is selected from saturated linear, branched and cyclic alkylene; arylalkylene; arylene, arylenealkylene and arene-bisalkylene radicals having from 1 to 6 carbon atoms in the alkylene radical and mixtures thereof.

4,036,812

METHOD OF STABILIZING ORGANIC MATERIALS EMPLOYING PYRAZOLE NICKEL COMPLEXES

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

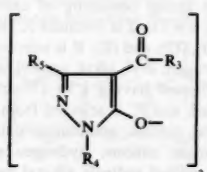
Division of Ser. No. 575,157, May 7, 1975, Pat. No. 3,959,265. This application Dec. 17, 1975, Ser. No. 641,678

Claims priority, application Switzerland, May 13, 1974, 6492/74

Int. Cl.[2] C08K 5/34

U.S. Cl. 260—45.75 N **8 Claims**

1. A stabilized composition comprising a natural or synthetic polymeric material susceptible to degradation under the effect of ultraviolet light and incorporated therein, in a sufficient amount to prevent said degradation, a nickel complex of the formula:



wherein either R_1 is hydrogen, alkyl (C_1–C_8) or $—CH_2CH_2OH$

and R_2 is alkyl (C_1–C_{18}); alkyl (C_1–C_{18}) monosubstituted by hydroxy, alkoxy (C_1–C_4), piperidino or morpholino; cyclohexyl; phenylalkyl (C_7 or C_8); phenylalkyl (C_7 or C_8) substituted on the phenyl nucleus by a total of 1 to 3 substituents, each substituent selected from the group consisting of alkyl (C_1–C_4) and hydroxy, with the proviso that there is a maximum of 2 alkyl substituents and a maximum of 1 hydroxy substituent; phenyl; phenyl monosubstituted by alkyl (C_1–C_{12}); phenyl monosubstituted by chloro; phenyl monosubstituted by unsubstituted phenyl or phenyl substituted by a total of 1 to 3 substituents, each substituent selected from the group consisting of alkyl (C_1–C_4) and hydroxy, with the proviso that there is a maximum of 1 hydroxy substituent and a maximum of 2 alkyl substituents;

or R_1 and R_2, together with the —NH— group to which they are bound, form a piperidine, morpholine, pyrrolidine or imidazolidine ring;

R_3 is alkyl (C_1–C_{22}); alkyl (C_1–C_{21})-thio-alkyl (C_1–C_{21}) with C_2–C_{22} in the aggregate thereof; alkyl (C_1–C_4) monosubstituted by chloro; alkyl (C_1–C_4) disubstituted by chloro; cycloalkyl (C_5–C_{12}); cycloalkyl (C_5–C_{11}) alkyl (C_1–C_7) with C_6–C_{12} in the aggregate thereof; phenylalkyl (C_7–C_{12}); phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by hydroxy; phenylalkyl (C_7–C_{12}) disubstituted on the phenyl nucleus by hydroxy; phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by alkyl (C_1–C_{12}); phenylalkyl (C_7–C_{12}) disubstituted on the phenyl nucleus by alkyl (C_1–C_{12}); phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by cycloalkyl (C_5–C_{12}); phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by cycloalkyl (C_5–C_{11})-alkyl (C_1–C_7) with C_6–C_{12} in the aggregate thereof; phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by alkyl (C_1–C_{12}); phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by hydroxy and disubstituted on the phenyl nucleus by alkyl (C_1–C_{12}); phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl (C_5–C_{12}); phenylalkyl (C_7–C_{12}) monosubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl C_5–C_{11})-alkyl (C_1–C_7) with C_6–C_{12} in the aggregate thereof; phenylalkyl (C_7–C_{12}) disubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by alkyl (C_1–C_{12}); phenylalkyl (C_7–C_{12}) disubstituted on the phenyl nucleus by hydroxy and disubstituted on the phenyl nucleus by alkyl (C_1–C_{12}); phenylalkyl (C_7–C_{12}) disubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl (C_5–C_{12}); phenylalkyl (C_7–C_{12}) disubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl (C_5–C_{11})-alkyl (C_1–C_7) with C_6–C_{12} in the aggregate thereof; phenyl; phenyl substituted by a total of 1 to 3 substituents, said substituents having not more than 18 carbon atoms, each substituent being selected from the group consisting of halo, cyano, meta-hydroxy, para-hydroxy, alkyl (C_1–C_{12}), alkoxy (C_1–C_{12}), phenyl, R_6–O and R_6–SO_2, wherein R_6 is phenyl, phenyl monosubstituted by alkyl (C_1–C_8) or phenyl disubstituted by alkyl (C_1–C_8), with the proviso that there is a maximum of 2 halo substituents, a maximum of 1 cyano substituent, only one of substituents meta-hydroxy and para-hydroxy, a maximum of 2 alkyl (C_1–C_{12}) substituents, a maximum of 2 alkoxy (C_1–C_{12}) substituents and only one of substituents R_6—O— and R_6—SO_2—; a heterocyclic ring selected from furyl, thienyl, benzothienyl, indolyl, pyridyl and quinoxalinyl; or a furyl, thienyl, benzothienyl, indolyl, pyridyl or quinoxalinyl ring substituted by a total of one or two substituents, each substituent being selected from the group consisting of halo, alkyl (C_1–C_4) and alkoxy (C_1–C_4);

R_4 and R_5 are each, independently, alkyl (C_1–C_8); phenyl; or phenyl substituted by a total of 1 to 3 substituents, each substituent being selected froom the group consisting of halo and alkyl (C_1–C_4), with the proviso that there is a maximum of 1 halo substituent and a maximum of 2 alkyl (C_1–C_4) substituents; and

p is 1 when the amine ligand is bidentate, and

p is 2 when the amine ligand is monodentate.

4,036,813
COMPOSITION FOR PROMOTING ADHESION OF CURABLE SILICONES TO SUBSTRATES

Bruce Bertolette Hardman, Mechanicville, and William Thomas Madigan, Valley Falls, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,618

Int. Cl.² C08G *77/04*

U.S. Cl. 260—46.5 G **12 Claims**

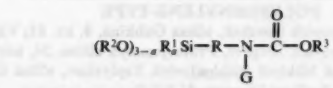
1. A self-bonding, low modulus, one-package room temperature vulcanizing silicone composition, having superior adhesion to substrates, comprising:

i. a silanol chain-stopped diorganopolysiloxane,

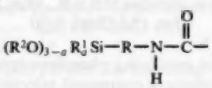
ii. a tri- or tetrafunctional, hydroxy-reactive silane or polysilane crosslinker therefor,

iii. a catalyst capable of promoting the reactions between (i) and (ii), and

iv. a small, effective, adhesion promoting amount of a composition comprising predominantly a compound of the formula:



wherein G is hydrogen or a group of the formula:



wherein R is a divalent radical selected from alkylene-arylene, alkylene and cycloalkylene of up to 8 carbon atoms, R^1 and R^3, independently, are radicals of up to 8 carbon atoms selected from hydrocarbyl or halohydrocarbyl, R^2 is a radical of up to 8 carbon atoms selected from hydrocarbyl, halohydrocarbyl or cyanohydrocarbyl, and *a* is 0 to 3, or a mixture of such compounds.

4,036,814
LIGHTLY CROSS-LINKED HYDROGEL FORMED FROM N-VINYL LACTAM AND HYDROPHOBIC ACRYLIC ESTER COMONOMER

John Gordon Bernard Howes, Hertford Heath; Nicholas Mario da Costa; Rupert Alec Selway, both of Harlow, and William Duncan Potter, Puckeridge, all of England, assignors to Warner-Lambert Company, Morris Plains, N.J.

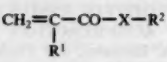
Filed June 25, 1975, Ser. No. 590,037

Claims priority, application United Kingdom, July 4, 1974, 29757/74; Apr. 28, 1975, 17586/75

Int. Cl.² C08F *26/08*

U.S. Cl. 260—47 UA **29 Claims**

1. A lightly crosslinked hydrogen copolymeric material with an uptake of physiological saline of between 65% and 85%, by weight, based on the total weight of gel, said material being formed from (1) at least one water soluble N-vinyl lactam and (2) as a comonomer, not more than 15 mole percent of at least one compound of formula:



wherein X is selected from the group consisting of —NH— and —O—; R^1 is sslected from the group consisting of hydrogen and alkyl groups containing from 1 to 4 carbon atoms; and R^2 is selected from the group consisting of (A) substituted and unsubstituted phenyl and naphthyl wherein the substituent groups are selected from the group consisting of benzyl, alkyl containing from 1 to 4 carbon atoms, alkoxy containing from 1 to 4 carbon atoms, halo, phenyl, and alkyl phenyl wherein the alkyl group contains from 1 to 4 carbon atoms; and (B) an alkyl group containing from 1 to 6 carbon atoms wherein the alkyl group is substituted by at least one member selected from the group consisting of substituted phenyl, phenyloxy, naphthyl and naphthyloxy, wherein the substituents are selected from the group consisting of benzyl, alkyl containing from 1 to 4 carbon atoms, alkoxy containing from 1 to 4 carbon atoms, halo, phenyl, and alkylphenyl wherein the alkyl group contains from 1 to 4 carbon atoms, and wherein when said member substituted on the alkyl group is substituted or unsubstituted phenyloxy or naphthyloxy, said member is substituted on a carbon atom of the alkyl group other than the carbon atom adjacent to the —X— group.

4,036,815
AROMATIC POLYMERS PREPARED FROM HALOPHENOLS CONTAINING KETO GROUPS

Ronald George Feasey, Knebworth, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 271,209, July 12, 1972, abandoned. This application July 9, 1975, Ser. No. 594,200

Claims priority, application United Kingdom, July 15, 1971, 33312/71

Int. Cl.² C08G *65/38*

U.S. Cl. 260—49 **9 Claims**

1. An aromatic polymer whose molecular chains consist essentially of units of the formula

alone or copolymerised with other units obtained by elimination of alkali metal halide from a member of the group consisting of alkali metal salts of other activated halophenols and mixtures of alkali metal salts of dihydric phenols with activated dihalobenzenoid compounds in which the halogen atoms in the halophenol or dihalobenzenoid compounds are activated by electron-attracting group selected from —CO— and —SO_2 ortho or para to the halogen atom.

4,036,816
PRODUCTION OF NOVEL THERMOSETTING PHENOL-FORMALDEHYDE RESINS BY CONTROLLED ACID REACTION

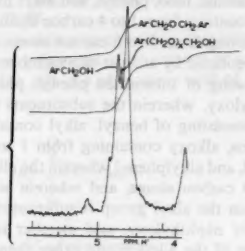
Ramesh C. Vasishth, Burnaby, and Pitchaiya Chandramouli, Richmond, both of Canada, assignors to Cor Tech Research Limited, Richmond, Canada

Continuation of Ser. No. 421,068, Dec. 3, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,576

Claims priority, application United Kingdom, Dec. 14, 1972, 57762/72

Int. Cl.[2] C08G 2/28, 2/30

U.S. Cl. 260—59 R **16 Claims**



1. A method for the production of a thermosetting phenol-formaldehyde resin, which comprises:

reacting phenol with formaldehyde in an aqueous reaction medium in the presence of a metal carboxylate catalyst therefor to form a thermosetting phenol-formaldehyde resin having benzyl ether linkages and hemiformal groups ortho to the phenolic hydroxyl groups and an infra-red spectrum which displays large absorption at wave numbers of approximately 1230 cm^{-1}, 1050 cm^{-1} and 1010 cm^{-1},

contacting said resin with at least one strong acid to cause a decrease of at lest 35% in the ratio of absorbance at 1010 cm^{-1}, measured from a base line drawn between wave numbers of 1030 cm^{-1} and 950 cm^{-1}, to that at 1230 cm^{-1}, measured from a base line drawn between wave number of 1130 cm^{-1} and 1310 cm^{-1}, to a value less than about 0.1, while leaving substantially unaffected the absorption at wave numbers of 1230 cm^{-1} and 1050 cm^{-1}, and

recovering the resulting thermosetting phenol-formaldehyde resin having a preponderance of benzyl ether linkages ortho to the phenolic hydroxyl groups, having substantially no tendency to cure upon extensive standing at ambient temperature and being capable of rapid cure at elevated temperature.

4,036,817
DIRECTION INDICATOR SWITCH

Norman Wilkinson, Higherford, near Nelson, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed July 15, 1975, Ser. No. 596,144

Claims priority, application United Kingdom, July 17, 1974, 31567/74

Int. Cl.[2] H01H 3/16

U.S. Cl. 200—61.27 **2 Claims**

1. A turn signal indicator mechanism for a road vehicle, said vehicle including a steering wheel with a striker moving in a fixed orbit in response to rotation of the steering wheel, said mechanism comprising:

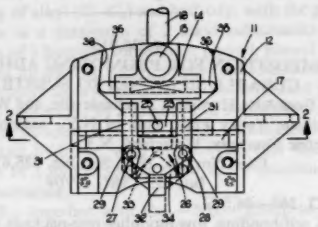
a fixedly mounted body;

a rotor mounted on said body and rotatably movable between a central rest position and first and second operative positions disposed on either side of said central rest position;

detent means, mounted on said body and rotor, for resiliently retaining said rotor in one of said positions;

a detent release member, movable with respect to said detent means, for releasing said detent means; and

pawl means, responsive to said rotor and urged into the orbit of said striker only when said rotor is in one of said operative positions, for operating said detent release member



when struck by said moving striker, said pawl means comprising, means for moving about one of a pair of spaced parallel axes, which of said axes being determined by the position of said rotor, means for projecting a portion of said pawl into the orbit of said striker when said rotor is in one of said operative positions, and means for engaging said detent release member.

4,036,818
METHOD OF PREPARING POLYMERS OF POLYPHENYLENE TYPE

Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Vladimir Alexandrovich Sergeev, Profsojuznaya ulitsa, 34, korpus 4, kv. 26, and Mikhail Mikhailovich Teplyakov, ulitsa Gastello, 37, kv. 3, all of Moscow, U.S.S.R.

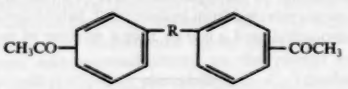
Continuation of Ser. No. 414,773, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 114,353, Feb. 10, 1971, abandoned. This application Dec. 22, 1975, Ser. No. 643,112

Claims priority, application U.S.S.R., Mar. 16, 1970, 1409968

Int. Cl.[2] C08G 6/00

U.S. Cl. 260—63 K **18 Claims**

1. A method for producing phenylene-type polymers comprising polycondensing a compound selected from the group consisting of diacetylbenzenes; diacetylnaphthalenes; diacetyl compounds represented by the formula



where R is a simple bond, $(CH_2)_m$ with $m=1$–20, O, or S; triacetylbenzene; or 1,3,5-tri(acetylphenyl) benzenes, in the presence of inorganic acid catalysts at a temperature within a range from −40° to 300° C.

4,036,819
UNSATURATED POLYESTER RESINS

Moustafa El-Chahawi, Troisdorf, and Norbert Vollkommer, Pfarrer, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

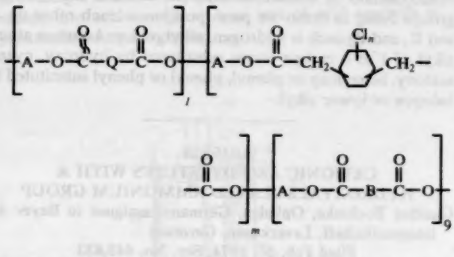
Filed May 15, 1975, Ser. No. 578,049

Claims priority, application Germany, May 21, 1974, 2424673

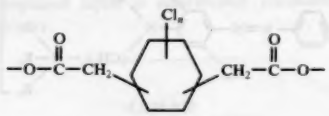
Int. Cl.[2] C08G 63/54, 63/68

U.S. Cl. 260—75 H **26 Claims**

1. An unsaturated polyester having recurring units of the formula:



wherein A is an alcoholic moiety, Q is a moiety of other saturated dicarboxylic acids and B is a moiety of an unsaturated dicarboxylic acid, n is 1 to 4, the sum $l + m + q$ is 2 to 20 and l may be 0 or a whole number. said polyester having between 1 and 80 mole percent of a chlorinated phenylene acetic acid moiety whose formula is:



4,036,820

NON-CATALYTIC PROCESS FOR PREPARING RAPID-SETTING RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 12, 1976, Ser. No. 704,861

Int. Cl.[2] C08G *18/28*

U.S. Cl. 260—77.5 AM **8 Claims**

1. A non-catalytic process for preparing rapid-setting polyurethanes having a density of at least about 1 g/cc and a percent elongation of less than about 100, and are demoldable within about 15 minutes, which process comprises:

A. admixing in the absence of a catalyst for urethane formation a first liquid component containing a polyol free of nitrogen atoms and having from about 2 to about 8 hydroxyl groups per molecule and an OH equivalent weight of less than about 200 with a second liquid component containing an aromatic polyisocyanate having an average of at least about 2 NCO groups per molecule with the proviso that when said first liquid component contains a polyol having an average of less than about 2.5 hydroxyl groups per molecule, then said second component contains an aromatic polyisocyanate or mixture of such polyisocyanates wherein the average number of NCO groups per molecule is at least about 2.5;

B. placing the resultant mixture into a suitable mold wherein said mixture solidifies within about 15 minutes to a solid having a density of at least about 1 g/cc and an elongation of less than about 100; and

C. Subsequently demolding the resultant article from the mold; wherein the temperature of said first and second component at the time of mixture is such that the temperature of the resultant mixture is at least about 50° C and is sufficient to provide a peak exotherm temperature of at least about 85° C and less than about 200° C and wherein said first and and second components are admixed in such proportions that the resultant NCO:OH equivalent ratio is from about 0.75:1 to about 1.5:1.

4,036,821

MANUFACTURE OF MODIFIED BASIC POLYAMINOAMIDE WITH AMMONIUM COMPOUND

Lutz Hoppe, and Rudolf Behn, both of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Oct. 24, 1974, Ser. No. 517,785

Claims priority, application Germany, Oct. 25, 1973, 2353430

Int. Cl.[2] C08G *69/48*

U.S. Cl. 260—78 SC **4 Claims**

1. A process for the production of a modified basic polyaminoamide resin which comprises the sequential steps of:

a. reacting substantially equimolar portions of a polyfunctional compound selected from the group consisting of epichlorhydrin, dichlorhydrin, or mixtures thereof, with a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, tributylamine, dimethylaniline, dimethylcyclohexylamine, or mixtures of any of said amines, to form an ammonium compound;

b. reacting 0.2 – 1.8 mols of said ammonium compound with each mol of secondary amine group in a water-soluble, basic polyaminoamide which is a condensation product of

1. a dicarboxylic acid,
2. a polyalkylenepolyamine, and
3. an aminocarboxylic acid or a lactam; and

c. reacting the product of step (b) with 0.15 – 0.19 mol of said polyfunctional compound per mol equivalent of secondary amino group in said polyaminoamide.

4,036,822

BEARING MATERIAL

Padma Ambalal Patel, Wembley, and Dennis Stanley Baker, High Wycombe, both of England, assignors to The Glacier Metal Company Limited, Alperton, England

Filed Sept. 30, 1975, Ser. No. 618,157

Claims priority, application United Kingdom, Oct. 2, 1974, 42750/74

Int. Cl.[2] C08F *28/00*

U.S. Cl. 260—79 **8 Claims**

1. A method of making a bearing lining by curing an arylene sulphide polymer by heating the same in the presence of an oxide of a metal selected from the group consisting of cadmium and manganese, in a proportion between 0.05% and 5.0% by weight of the lining, in which method the heating accelerates the curing and acts of liberate oxygen which assists in achieving cross linking.

4,036,823

BARBITURIC ACID ANTIGENIC CONJUGATES, THEIR PREPARATION, ANTIBODIES AND USE

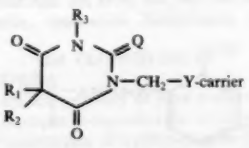
James R. Soares, Santa Monica, Calif., assignor to Biological Developments, Inc., Encino, Calif.

Filed Apr. 28, 1975, Ser. No. 571,974

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 R **25 Claims**

1. A synthetic antigen comprising a hapten coupled to a carrier which has the following formula:



where Q is selected from the class consisting of O and S; R_1 has from 1 to 3 carbon atoms and is selected from the class consisting of saturated and unsaturated hydrocarbon groups, monohalo substituted hydrocarbon groups, ether groups, thioether

groups; R_2 is selected from the class consisting of hydrocarbon groups containing from 1 to 6 carbon atoms; R_3 is selected from the class consisting of H and CH_3; $—CH_2—Y—$ is a residue from a linking agent which has been coupled to the hapten and to the carrier and Y comprises a member selected from the class consisting of a direct bond, saturated and unsaturated straight and branched chain alkylene groups having from 1 to 6 carbon atoms and aromatic groups having from 6 to 14 carbon atoms; and the carrier is macromolecule which confers antigenicity.

4,036,824

DISAZO DYESTUFFS CONTAINING ω-O-ALKYLENE-O-SO_3H GROUP

Karl-Ludwig Moritz, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

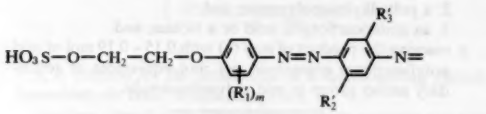
Filed Dec. 2, 1970, Ser. No. 94,523

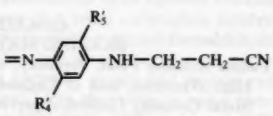
Claims priority, application Germany, Dec. 4, 1969, 1960816; July 16, 1970, 2035317

Int. Cl.[2] C09B *31/04, 31/08, 43/18*

U.S. Cl. 260—186 **2 Claims**

1. Disazo dyestuff of the formula





in which

R'_1 is chlorine or methyl;

R'_2 is hydrogen, chlorine, methyl, or methoxy;

R'_3 is hydrogen or methoxy;

R'_4 is hydrogen, chlorine, methyl, formylamino, acetylamino, hydroxyacetylamino, benzoylamino, methoxycarbonylamino, ethoxycarbonylamino, benzenesulfonylamino, toluenesulfonylamino, methylsulfonylamino, or ethylsulfonylamino;

R'_5 is hydrogen, methyl, or methoxy;

and m is a number from 0 to 2.

4,036,825

MONOAZO REACTIVE DYESTUFFS

Hermann Fuchs, Kelkheim, Taunus, and Fritz Meininger, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

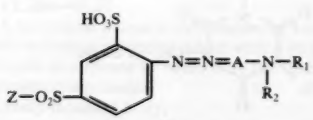
Continuation-in-part of Ser. No. 303,625, Nov. 3, 1972, abandoned. This application Oct. 7, 1976, Ser. No. 730,428

Claims priority, application Germany, Nov. 5, 1971, 2154942

Int. Cl.[2] C09B *29/06, 29/26, 29/30, 29/38*

U.S. Cl. 260—196 **8 Claims**

1. A monoazo dyestuff in the free acid form of the formula



wherein Z is $—CH_2—CH_2—OSO_3H$ or $—CH=CH_2$, A is phenylene, naphthylene or either phenylene or naphthylene substitued by hydroxy, sulfonic acid, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, acetylamino, carboxylic acid, carboxylic acid amide, sulfonic acid amide, benzoylamino or trifluoromethyl, the azo and the $—NR_1R_2$ groups being in ortho- or para- position to each other on A, and R_1 and R_2 each is hydrogen, alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by hydroxy, cyano, acetoxy, benzyloxy or phenyl, phenyl or phenyl substituted by halogen or lower alkyl.

4,036,826

CATIONIC AZO DYESTUFFS WITH A HYDROXYALKYLATED AMMONIUM GROUP

Gunther Boehmke, Opladen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

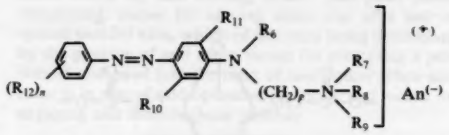
Filed Feb. 26, 1974, Ser. No. 445,833

Claims priority, application Germany, Feb. 26, 1973, 2309528

Int. Cl.[2] C09B *29/08, 29/26, 29/36, 43/00*

U.S. Cl. 260—205 **6 Claims**

1. Cationic azo dyestuff of the formula



wherein

R_6 denotes methyl, ethyl, propyl, or butyl,

R_7 denotes methyl, ethyl, propyl or butyl,

R_8 denotes methyl, ethyl, propyl or butyl,

R_9 denotes 2-hydroxypropyl, 2-hydroxybutyl, 2-hydroxyethylphenyl, 2-hydroxy-3-methoxy-propyl, 2-hydroxy-3-chloro-propyl, 2-hydroxy-3-ethoxy-propyl, 2-hydroxy-3-propoxy-propyl, 2-hydroxy-3-allyloxy-propyl, 2-hydroxy-3-butoxy-propyl, 2-hydroxy-3-phenoxy-propyl or 2-hydroxy-3-benzoxy-propyl,

R_{10} denotes hydrogen, methyl, ethyl, propyl, butyl, chloro, bromo, methoxy, ethoxy, propoxy, acetylamino, propionylamine or methylsulphonylamino,

R_{11} denotes hydrogen, methyl, ethyl, propyl, butyl, chloro, bromo, mthoxy, ethoxy or propoxy,

R_{12} denotes methyl, ethyl, propyl, butyl, chloro, bromo, cyano, nitro, methoxy, ethoxy, propoxy, methoxycarbonyl or ethoxycarbonyl, acetoxy, acetyl, sulphonamido or carbonamido,

n denotes 1 to 5,

p denotes 2 or 3 and

$An^{(-)}$ denotes an anion.

4,036,827

CONDUCTIVE LIQUID SWITCHES

Donald S. Rich, Flanders, N.J., assignor to Inflo Systems, Inc., Chester, N.J.

Continuation of Ser. No. 345,358, March 27, 1973, which is a continuation-in-part of Ser. No. 197,707, Nov. 11, 1971, and Ser. No. 300,484, Oct. 25, 1972, abandoned. This application June 13, 1975, Ser. No. 586,543

Int. Cl.[2] H01H *29/02*

U.S. Cl. 200—209 **30 Claims**

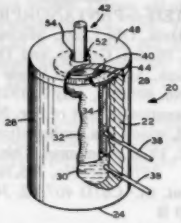
1. An electrical switch comprising:

a. housing means having a cavity therewithin, said cavity is defined by surfaces of said housing;

b. electrically conductive liquid means within said cavity and supported upon a first of said housing surfaces;

c. plunger means within said cavity; at least a part of said plunger means and a part of a second of said housing surfaces defining therebetween at least one passageway, said passageway extending substantially upwardly with respect to said first surface of said housing; and

d. electrical contact means comprising electrical contacts for providing a conductive path from outside of said housing means into said cavity, at least one of said contacts is proximate said passageway;



e. said plunger, upon being depressed from an initial position, displaces at least a part of said liquid;

f. said plunger and said cavity are so dimensioned such that said displaced liquid is substantially restricted to said passageway.

4,036,828

3,4-BIS(4-SUBSTITUTED PIPERAZINYL)-3-CYCLOBUTENE-1,2-DIONES AND RELATED COMPOUNDS

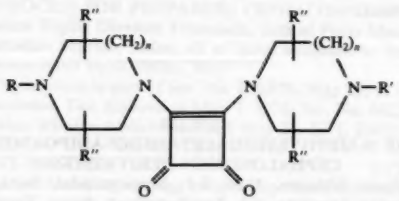
Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 622,808, Oct. 16, 1975, abandoned. This application July 13, 1976, Ser. No. 704,882

Int. Cl.[2] C07D *295/10, 243/08, 241/02*

U.S. Cl. 260—239 BC **13 Claims**

1. A compound of the formula



wherein R and R′ are the same or different and are alkyl radicals having 1 to 15 carbon atoms; R″ is hydrogen or methyl; and *n* is one or two.

4,036,829

LACTONYL ESTERS OF PENICILLINS

Harry Ferres, and John Peter Clayton, both of Horsham, England, assignors to Beecham Group Limited, England

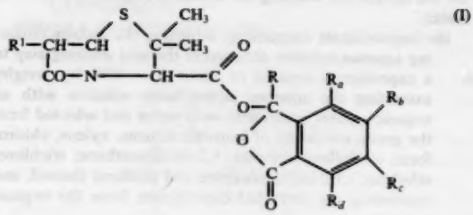
Continuation of Ser. No. 524,776, Nov. 18, 1974, abandoned, which is a continuation of Ser. No. 259,941, June 5, 1972, abandoned. This application Aug. 5, 1976, Ser. No. 712,821

Claims priority, application United Kingdom, June 9, 1971, 19604/71

Int. Cl.[2] C07D *499/44, 499/46, 499/48, 499/64*

U.S. Cl. 260—239.1 **37 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable acid addition salt of said compound having a basic nitrogen atom:



(I)

wherein R is hydrogen, methyl or phenyl; R_a, R_b, R_c and R_d are selected from hydrogen, lower alkyl, lower alkoxy, halo and nitro; R^1 is an antibacterially active penicillin-completing side chain selected from phenylacetamido, p-hydroxyphenylacetamido; p-heptylphenylacetamido; phenoxyacetamido; α-phenoxypropionamido; α-phenoxybutyramido; 2,6-dimethoxyphenylacetamido; 3-phenyl-5-methyl-isoxazole-4-carbamido; 3-(2-chlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2,6-dichlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2-chloro-6-fluorophenyl)-5-methyl-isoxazole-4-carbamido; 2-ethoxy-naphthyl-1-carbamido; o, m or p-aminophenylacetamido; 3-carboxy-quinoxalin-2-carbamido; 2-furylacetamido; 2-thienylacetamido; 3-thienylacetamido; 3-pyridylacetamido; isothiazolylacetamido; 3-hexenamide; 2-biphenylamido; n-hexanamido; n-octanamido; propionamido; α-aminophenylacetamido; α-amino-2-thienylacetamido; α-amino-3-thienylacetamido; α-methyl-aminophenylacetamido; α-amino-2- or -3- or -4-chlorophenylacetamido; α-amino-2-methoxy-phenylacetamido; α-amino-2,4-dichlorophenylacetamido; α-amino-3,4-dichlorophenylacetamido; α-amino-α-methylphenylacetamido; α-amino-4-hydroxyphenylacetamido; α-amino-3-chloro-4-hydroxyphenylacetamido; α-methylphenylacetamido; α-hydroxyphenylacetamido; α-carboxyphenylacetamido; α-(5-tetrazolyl)phenylacetamido; α-quanidino-2-thienylacetamido; α-guanidino-4-hydroxyphenylacetamido α-guanidino-4-hydroxy-2- or -3-methylphenylacetamido; α-carboxy-3-thienylacetamido; α-sulphaminophenylacetamido; α-sulphamino- 3-thienylacetamido; α-(N-methylsulphamino)-phenylacetamido; α-azidophenylacetamido; 1-aminocyclohexylcarbamido; 1-aminocyclopentylcarbamido; 5-amino-5-carboxypentanamido; α-phenoxyphenylacetamido; α-phenyl-β-sulphaminopropionamido; α-sulphophenylacetamido; α-guanidinophenylacetamido; β-amino-β-cyclohexylpropionamido; α-(benzyloxycarbonyl)-phenylacetamido; or 2,2-dimethyl-5-oxo-4-phenyl-1-imidazolidinyl, (hexahydro-1H-azepin-1-yl)methyleneamino or N,N-dimethylformamidino, provided that when R is hydrogen and R^1 is D-α-aminophenylacetamido R_a, R_b, R_c and R_d are not all hydrogen.

4,036,830

PROCESS FOR THE RECOVERY OF PURE ε-CAPROLACTAM FROM AN AQUEOUS SOLUTION THEREOF

Abraham H. de Rooij, Geleen, and Reijer Goettsch, Beek, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 29, 1976, Ser. No. 681,745

Claims priority, application Netherlands, May 1, 1975, 7505130

Int. Cl.[2] C07D *201/16*

U.S. Cl. 260—239.3 A **6 Claims**

1. In a process for recovery of pure ε-caprolactam from a contaminated aqueous ε-caprolactam solution obtained by intramolecular conversion of cyclohexanone oxime with the acid catalyst sulfuric acid, oleum or sulfur trioxide including extracting the reaction mixture after dilution with water and treating with ammonia with a water-immiscible organic solvent for the lactam and washing the lactam in organic solvent

for the lactam and washing the lactam in organic solvent with water,

the improvement comprising: adjusting the lactamcontaining aqueous solution obtained in the said washing step to a caprolactam content of about 60 – 75% by weight, extracting the aqueous lactam-laden solution with an organic solvent immiscible with water and selected from the group consisting of benzene, toluene, xylene, chloroform, methylene chloride, 1,2-dichloroethane, trichloroethylene, 1,1,2-trichloroethane and mixtures thereof, and recovering the extracted caprolactam from the organic solvent.

4,036,831

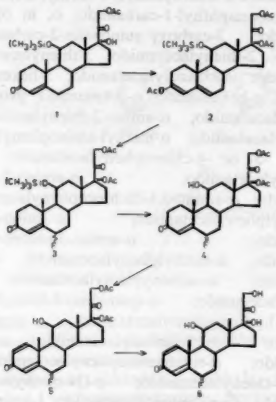
TRIMETHYL SILOXANE STEROID INTERMEDIATES

Bjarte Loken, Rho (Milan); Peter Lindsay MacDonald, and Ettore Bigatti, both of Milan, all of Italy, assignors to Steroid Development Company Establishment, Lugano, Switzerland

Filed Oct. 28, 1975, Ser. No. 626,059

Int. Cl.[2] C07J *71/00*

U.S. Cl. 260—239.55 D **18 Claims**



1. A process for producing corticoids characterized by at least one of the following substituents:

a. 6α-F

b. 16α,17α-hydroxy or isopropylidenedioxy

c. 16α or β-methyl

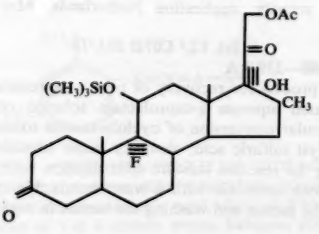
d. Δ1,4 from an 11β-OH precursor steroid, of the pregnane series which comprises:

1. reacting the 11β-OH precursor steroid with trimethylchlorosilane forming thereby the corresponding 11β-trimethyl-siloxy steroid;

2. carrying out a multi-step reaction sequence incorporating at least one of the (a), (b), (c), (d) substituents into the 11β trimethyl siloxy steroid; and thereafter

3. hydrolyzing off the trimethyl siloxy group to create the 11β-OH group.

16. A steroid according to the following formula:



where 16 CH_3 may be 16αCH_3 or 16βCH_3.

4,036,832

15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

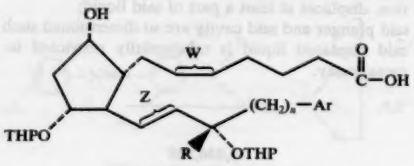
Hans-Jurgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., N.Y.

Division of Ser. No. 485,599, July 3, 1974, Pat. No. 3,971,826, which is a continuation-in-part of Ser. No. 425,519, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 271,220, July 13, 1972, abandoned. This application July 15, 1976, Ser. No. 705,767

Int. Cl.[2] C07D *407/02, 309/02*

U.S. Cl. 260—240 R **4 Claims**

1. A compound of the structure:



wherein

Ar is α- or β-naphthyl; phenyl; 3,4-dimethoxyphenyl; 3,4-methylenedioxyphenyl; 3,4,5-trimethoxyphenyl or monosubstituted phenyl wherein said substituent is halo, trifluoromethyl, phenyl, lower alkyl or lower alkoxy;

R is hydrogen or lower alkyl;

THP is 2-tetrahydropyranyl;

n is an integer from 1 to 5;

W is a single bond or a cis double bond;

and Z is a single bond or trans double bond; with the proviso that when *n* is one and Z is a single bond, W is a single bond.

4,036,833

7-[(5'-N-METHYLTHIOACETAMIDO)-ADIPOAMIDO] CEPHALOSPORIN DERIVATIVES

Toshiyasu Ishimaru, D-14, 2-7, Momoyamadai, Suita, and Mariko Kawabata, 9-4, Tachibanacho-1 chome, Toyonaka, both of Japan

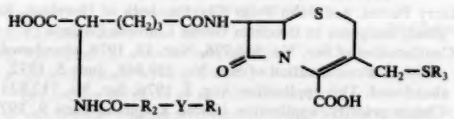
Filed May 27, 1975, Ser. No. 580,965

Claims priority, application Japan, May 28, 1974, 49-61296; July 3, 1974, 49-76771

Int. Cl.[2] C07D *501/36*

U.S. Cl. 260—243 C **5 Claims**

1. A compound of the formula



wherein

R_1 is a lower alkyl, phenyl or benzyl group, R_2 is a lower alkylene group, Y is a sulfur atom or a sulfinyl group and R_3 is a thiadiazolyl, tetrazolyl or oxadiazolyl group;

or a pharmaceutically acceptable salt or adduct thereof.

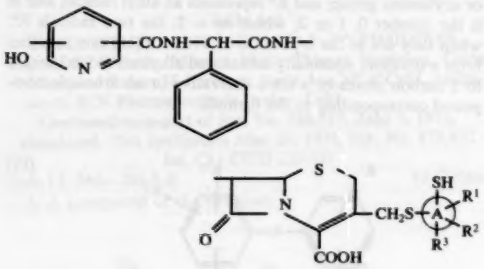
4,036,834

DERIVATIVES OF 7-(α-HYDROXY-SUBSTITUTED PYRIDYL CARBOXAMIDO-α PHENYL-ACETAMIDO-3-SUBSTITUTED THIO METHYL Δ³-CEPHEM-4-CARBOXYLIC ACID

Masuo Murakami, Tokyo; Masaru Iwanami, Yokohama; Ichiro Isaka, Hoya; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo, and Tetsuya Maeda, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1975, Ser. No. 620,552
Claims priority, application Japan, Oct. 11, 1974, 49-116976
Int. Cl.² C07D *501/36*
U.S. Cl. 260—243 C 8 Claims

1. A 7-(α-hydroxy-substituted pyridylcarboxamido-α-phenylacetamido)-3-substituted thiomethyl-Δ³-cephem-4-carboxylic acid derivative represented by the formula:



wherein A represents an unsaturated 6-membered ring having one sulfur atom or 2 or 3 nitrogen atoms and the remaining members being carbon atoms and R^1, R^2, and R^3, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a lower alkylthio group, an amino group, a lower alkanoylamido group, or an oxo group
and a pharmacologically acceptable salt thereof.

4,036,835

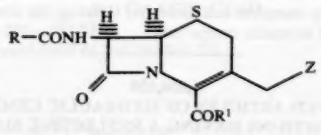
PROCESS FOR PREPARING CEPHALOSPORINS

Maurizio Foglio; Giovanni Franceschi, both of Paolo Masi, and Antonino Suarato, Milan, all of Italy, assignors to Societa' Farmaceutici Italia, Milan, Italy

Continuation-in-part of Ser. No. 578,875, May 19, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,338
Claims priority, application Italy, May 22, 1974, 23070/74
Int. Cl.² C07D *501/02*
U.S. Cl. 260—243 C 2 Claims

1. A process for preparing a cephalosporin of structure:

III



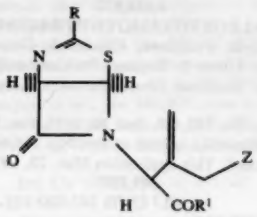
where R is selected from the class consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, cyano-methyl-, thienyl-methyl-, naphthyl-methyl-, phenyl-methyl-, phenoxy-methyl-, phenyl-isopropyl-, phenoxy-isopropyl-, pyridyl-4-thiomethyl-, and tetrazolyl-1-methyl-;

R^1 is selected from the class consisting of a hydroxyl, alkoxy having from 1 to 4 carbon atoms, trichloroethoxy-, benzyloxy-, p-methoxy-benzyloxy-, p-nitrobenzyloxy-, benzhydryloxy-, triphenylmethoxy-, phenacyloxy, and p-halophenacyloxy;

Z is selected from the class consisting of hydrogen, —O—alkyl, —O—CO—alkyl, —Br, —I, —N_3, —NH_2, —O—CO—CH_3, —O—CO—NH_2, and 2-mercapto-5-methyl-1,3,4-thiadiazole;

wherein a compound of structure

(I')



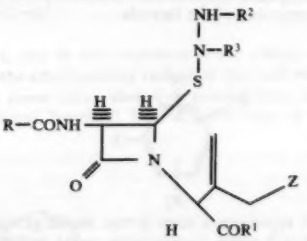
dissolved in acetone or tetrahydrofuran is reacted at a temperature between −20° C and +80° C in the presence of p-toluenesulphonic, sulphuric, trifluoroacetic, formic or oxalic acid, with an azoderivative of the formula

wherein R^2 and R^3 are the same or different and represent CN—, or the radicals —COR^4, —$COOR^4$,

—$CONHR^4$, where R_4 is a lower alkyl having from 1 to 4 carbon atoms,

to give a compound of the structure:

(II')



in which R, R^1, R^2, R^3 and Z have the meanings given above, and said intermediate (II'), dissolved in benzene, ethyl acetate or dimethylformamide, is reacted at a temperature between −100° C and +120° C with an aluminum or silicon oxide or with potassium or sodium hydroxide, potassium tert. butoxide or lithium methoxide, to finally give the desired compound (III) which is isolated and purified in known manner.

4,036,836

PROCESS FOR PRODUCING 2-PYRROLIDONE

Janice L. Greene, Chagrin Falls, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,883
Int. Cl.² C07D *207/26*
U.S. Cl. 260—326.5 FN 5 Claims

1. In the process for the preparation of 2-pyrrolidone by contacting an aqueous mixture of succinonitrile with hydrogen

at elevated temperatures and pressures in the presence of a hydrogenation catalyst, the improvement comprising employing a hydrogenation catalyst consisting essentially of nickel boride.

4,036,837

2 ALKOXYOXAMOYL-PYRAZINES

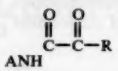
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, and Albert J. Begany, Perkiomenville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,796

Int. Cl.[2] C07D *241/02*

U.S. Cl. 260—250 BN **2 Claims**

1. A compound of the formula:



in which

A is 2-pyrazinyl and R is alkoxy of 1 to 6 carbon atoms.

4,036,838

PROCESS FOR THE PRODUCTION OF NITRO DERIVATIVES OF AROMATIC COMPOUNDS

Axel Vogel, Cologne; Friedrich Durholz, Remscheid; Rudolf Sundermann, and Guido Skipka, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

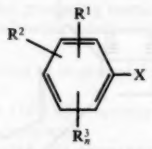
Filed Dec. 30, 1974, Ser. No. 537,624

Claims priority, application Germany, Jan. 9, 1974, 2400887

Int. Cl.[2] C07D *239/00*

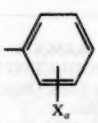
U.S. Cl. 260—251 R **17 Claims**

1. A process for the production of a nitro derivative of an aromatic compound which consists essentially of contacting an aromatic compound of the formula

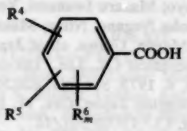


(I)

in which X represents a nitro group, nitrile group, aldehyde group, carboxyl group, carbonamide group, sulfonic or sulfochloride group, an optionally monoalkyl- or dialkyl-substituted sulfonamide group, an alkoxy carbonyl group, an optionally monoalkyl- or dialkyl-substituted amino carbonyl group or an acyl group; R^1 represents hydrogen, halogen, the nitro group or an optionally substituted acyl group; R^2 represents hydrogen, halogen, and alkyl, alkoxy, carbalkoxy or acylamino group or the group

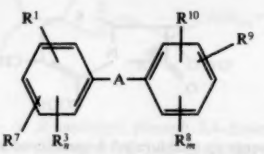


in which X is as above-defined; *a* is 1 or 2, this group optionally being substituted by substituents which are inert under the nitration conditions; R^3 represents an alkyl group; and *n* is the number 0, 1 or 2 where $n = 2$, the two radicals R^3 when they are in the ortho-position to one another, may together also form a divalent, optionally substituted alkylene radical with 3 to 5 carbon atoms, or a compound of the formula



(III)

wherein R^4 represents hydrogen, halogen the nitro group, a phenyl carbonyl or phenyl sulfonyl group optionally substituted by substituents which are inert under the nitration conditions or an optionally substituted acyl group; R^5 represents hydrogen, halogen, nitrophenyl, an alkyl, alkoxy, carbalkoxy or acylamino group; and R^6 represents an alkyl radical; and *m* is the number 0, 1 or 2; where $m = 2$, the two radicals R^6, when they are in the o-position to one another, may together form a divalent, optionally substituted alkylene radical with 3 to 5 carbon atoms or a nitro derivative or an aromatic compound corresponding to the formula



(IV)

in which R^1, R^3 and *n* are as previously defined; R^7 represents hydrogen, halogen, an alkyl group, an alkoxy group, a carbalkoxy group or an acylamino group; A represents a carbonyl (—CO—) or sulfone ($—SO_2—$) group; and R^8 has one of the meanings above-defined for the radical R^3; R^9 has one of the meanings above-defined for the radical R^7; R^{10} has one of the meanings above-defined for the radical R^1; *m* is the number 0, 1 or 2; where either *n* and *m* are the numbers 1 or 2, one of each radicals R^3 and R^8, when they are in the o-positions to the radical A, may together form a single bound with nitric acid or a nitrating agent in the presence of an aliphatic or cycloaliphatic hydrocarbon having up to 12 carbon atoms monosubstituted or polysubstituted by halogen, the nitro group or an alkyl sulfonyl group or a compound selected from the group consisting of anthraquinone, phenathraquinone, diphenylene sulfone, pyridine-N-oxide, pyrimidine, quinoline, quinoline-N-oxide and isoquinoline, or a derivative thereof, in the presence of a mineral or Lewis acid, said process being conducted while maintaining said aliphatic or cycloaliphatic hydrocarbon in admixture with said aromatic compound until the process is substantially complete and thereafter isolating the nitro derivative of said aromatic compound.

4,036,839

SHAPED ARTICLES OF HYDRAULIC CEMENT COMPOSITIONS HAVING A REFLECTIVE SURFACE

Mark Plunguian, 6912 Columbia Drive, and Charles E. Cornwell, 7104 Marlan Drive, both of, Alexandria, Va. 22307

Continuation-in-part of Ser. No. 591,095, June 27, 1975, Pat. No. 3,995,086. This application Jan. 16, 1976, Ser. No. 649,895

Int. Cl.[2] B28B *1/16*

U.S. Cl. 264—256 **4 Claims**

1. A method of producing a shaped article with a glossy surface comprising the steps of dispersing in water about 100 parts by weight of a hydraulic cement, selected from the group consisting of portland cement, and gypsum cement; 10–400 parts aggregate; 0.25–2.0 parts of a cement dispersing agent selected from the group of polymers consisting of the alkali

metal salts of melamine sulfonic acid partially condensed with formaldehyde, the alkali metal salt of naphthalene sulfonic acid partially condensed with formaldehyde, and about 30–90 percent of the alkali metal salt of a high molecular weight condensation product of naphthalene-sulfonic acid and the balance 70–10 percent being the alkali metal salt of gluconic acid; 0.01–0.1 parts of a cement curing retarder; and 0–10 parts color pigment, all in parts by weight; using the dispersion thus formed to fill a synthetic polymer mold having a glossy, water-repellent surface, or a mold coated with a synthetic polymer, said polymer being selected from the group consisting of polystyrene, polypropylene, and polyacrylic resins; filling the mold with the cementitious composition, curing the casting, and then removing it from the mold.

4,036,840

2-SUBSTITUTED-S-TRIAZOLO[1,5a]PYRIMIDINES

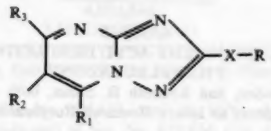
Darrell E. O'Brien, Mission Viejo; Thomas Novinson, Costa Mesa, and Robert H. Springer, Santa Ana, all of Calif., assignors to ICN Pharmaceuticals, Irvine, Calif.

Continuation-in-part of Ser. No. 260,517, June 7, 1972, abandoned. This application May 22, 1975, Ser. No. 579,832

Int. Cl.[2] C07D *239/00*

U.S. Cl. 260—256.5 R **12 Claims**

1. A compound of the structure



wherein X is thio or sulfonyl; R is C_2–C_6 alkyl, C_3–C_7 branched alkyl, dicarbethoxymethyl, benzyl, substituted benzyl wherein the substitutions are C_1–C_6 alkyl, halogeno, carboxy, hydroxyl or a combination of those substituents, naphthyl and phenethyl; R_1 is C_1–C_6 alkyl; R_2 is H and R_3 is C_1–C_6 alkyl or acetonyl.

4,036,841

INDOLO[2,3α]QUINOLIZINE DERIVATIVES

Csaba Szántay; Lajos Szabo; György Kalaus; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

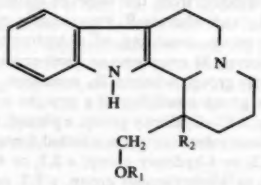
Filed May 6, 1975, Ser. No. 575,038

Claims priority, application Hungary, May 7, 1974, RI 536

Int. Cl.[2] C07D *459/00*

U.S. Cl. 260—293.53 **5 Claims**

1. A compound of the formula (I),



(I)

wherein R_1 is a lower alkyl carbonyl, benzoyl or benzoyl substituted with lower alkoxy, and R_2 is an alkyl group having 1 to 4 carbon atoms, the optically active enanthiomers and the pharmaceutically acceptable salts thereof.

4,036,842

PROCESS FOR PREPARING POLYCYCLIC HETEROCYCLES HAVING A PYRAN RING

Thomas A. Dobson; Leslie G. Humber, both of Dollard des Ormeaux; Christopher A. Demerson, and Ivo L. Jirkovsky, both of Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

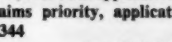
Continuation-in-part of Ser. No. 311,023, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,714, Sept. 15, 1972, Pat. No. 3,939,178, which is a continuation-in-part of Ser. No. 148,895, June 1, 1971, Pat. No. 3,843,681. This application Sept. 15, 1975, Ser. No. 613,160

Claims priority, application South Africa, May 16, 1972, 72/3344

Int. Cl.[2] C07D *491/14, 491/22*

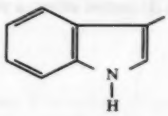
U.S. Cl. 260—293.58 **11 Claims**

1. A process for preparing a polyclclic heterocycle compound having a pyran ring which comprises reacting in the presence of a Friedel Crafts type catalyst a compound of the formula II:



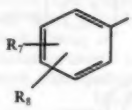
B—CH_2CH_2OH (11)

wherein B is

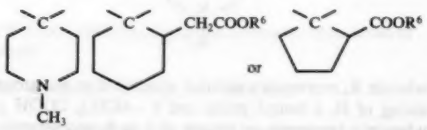


with a compound of the formula III:

in which L and M each represent lower alkoxy or together represent the ethylenedioxy radical or oxo, and wherein R^1 is hydrogen, lower alkyl, phenyl or p-halophenyl, and R^2 is 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl; or R^2 is



wherein R^7 and R^8 are the same or different and each represent halo, hydroxyl, carboxyl, carb(lower)alkoxy, or R^1 and R^2 together with the carbon atoms to which they are both joined to form a radical of the formula



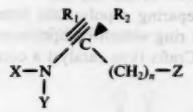
in which R^6 is lower alkyl.

4,036,843
CERTAIN CHLOROAMINO ESTERS OF PYRIDINE CARBOXYLATES AND DERIVATIVES THEREOF

James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Nov. 14, 1975, Ser. No. 632,012
Int. Cl.[2] C07D *213/80, 213/79*
U.S. Cl. 260—294.8 R 20 Claims

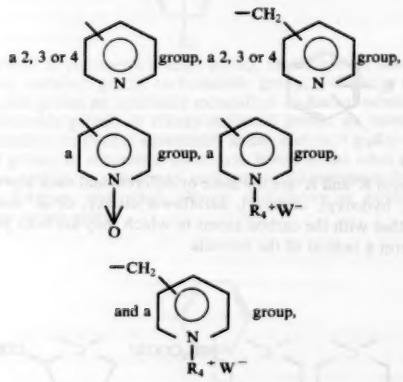
1. A compound having the formula:



(I)

wherein X and Y each represent a member which may be the same or different selected from the group consisting of H and Cl with the proviso that X and Y cannot represent H simultaneously; R_1 and R_2 each represent a member which may be the same or different selected from the group consisting of an *n*- or branched alkyl group of from 1 to 20 carbon atoms, a phenyl group a naphthyl group and a

group, wherein *m* represents an integer of from 2 to 5; *n* represents an integer of 1 to 8; and Z represents —$OOCR_3$ group, wherein R_3 represents a member selected from the group consisting of



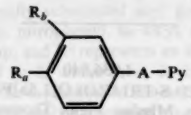
wherein R_4 represents a member selected from the group consisting of H, a benzyl group and a —$(CH_2)_p$ COOH group, wherein *p* represents an integer of 1 to 4, and wherein W— represents a nontoxic pharmaceutically acceptable inorganic or organic anion.

4,036,844
ARYLOXYPYRIDINES

David Edward Thorne, Cranleigh, England, and Kurt Engel, Basel, Switzerland, assignors to Beecham Group Limited, England

Continuation of Ser. No. 346,252, March 30, 1973, abandoned. This application Oct. 29, 1975, Ser. No. 626,720
Claims priority, application United Kingdom, Apr. 4, 1972, 15280/72; Dec. 23, 1974, 55441/74
Int. Cl.[2] C07D *213/55*
U.S. Cl. 260—295 R 8 Claims

1. A compound of the formula



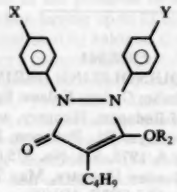
or a pharmaceutically acceptable non-toxic acid addition salt thereof, wherein Py is 3- or 4-pyridyl unsubstituted or meta- or -para-lower alkyl substituted A is [ALK-O] or [ALK-O-ALK] wherein ALK is straight or branched chain alkylene of 1 to 6 carbon atoms, only one of R_a and R_b is hydrogen and the other is selected from the group consisting of carboxy, carboloweralkoxy, cyano and carbamyl.

4,036,845
NOVEL TRANSIENT ACYL DERIVATIVES OF PHENYLBUTAZONE

Nicolae S. Bodor, and Kenneth B. Sloan, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

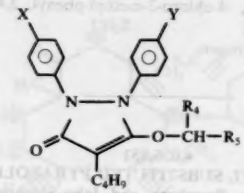
Division of Ser. No. 538,903, Jan. 6, 1975, Pat. No. 3,957,803. This application Mar. 8, 1976, Ser. No. 664,698
Int. Cl.[2] C07D *231/06*
U.S. Cl. 260—295 L 44 Claims

1. A pro-drug compound of the formula:



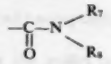
(I)

wherein X and Y each represent a member selected from the group consisting of a hydrogen atom and a —OR_1 group, with the proviso that either X or Y is a hydrogen atom and wherein R_2 is a member selected from the same or different groups represented by R_1; and wherein R_1 represents a member selected from the group consisting of a hydrogen atom, a COOM group, wherein M represents an alkali or alkaline earth metal, a —CO—R_3 group, wherein R_3 represents a member selected from the group consisting of a straight or branched C_1–C_5 alkyl group, a C_1–C_2 alkoxy group, a phenyl, substituted phenyl group whose substituents are selected from the group consisting of a 2,3, or 4-hydroxy group, a 2,3, or 4-acetyloxy group, and a 2,3, or 4-acetylamino group, a 2,3, or 4-pyridyl group, a 1,2, or 5-imidazolyl group, a residue of an N-protected naturally occurring amino acid, wherein the protective group on the amino group of the amino acid is removable via hydrogenolysis or hydrolysis, and an amino acid residue containing a C_1–C_2 N,N-dialkylamino or C_4–C_5 cycloalkylamino group.



(II)

wherein X or Y represents a member selected from the group consisting of a hydrogen atom and a —OR_1 group, wherein R_1 is as defined above with the proviso that either X or Y is a hydrogen atom; wherein R_4 represents a member selected from the group consisting of a hydrogen atom, a C_1–C_5 alkyl group, and a —$CH=CH_2$ group; and wherein R_5 represents a member selected from the group consisting of a —$OOC—R_6$ group, a group, and a —COOM group,



wherein M represents an alkali or alkaline earth metal, wherein R_6 represents a member selected from the group consisting of R_4 as defined above, with the proviso that R_6 cannot be a hydrogen atom, and wherein R_7 and R_8 each represent a C_1–C_3 aklyl group.

4,036,846

3-HYDROXY AND 3-ACETOXY-6-TRIPHENYL-METHYLAMINOPENAMS

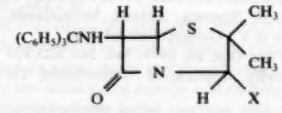
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 680,423, April 26, 1976, which is a continuation-in-part of Ser. No. 619,634, Oct. 6, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,811

Int. Cl.[2] C07C *499/78*

U.S. Cl. 260—306.7 C **3 Claims**

1. A compound of the formula



wherein X is hydroxy or acetoxy.

4,036,847

HALOGENATED PENAM DERIVATIVES AND THE PREPARATION THEREOF

Takashi Kamiya, Suita; Yoshihisa Saito, Takarazuka; Tsutomu Teraji, Hirakata; Osamu Nakaguti, Osaka; Teruo Oku, Kyoto; Hitoshi Nakamura, and Masashi Hashimoto, both of Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

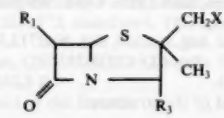
Division of Ser. No. 427,232, Dec. 21, 1973, which is a continuation-in-part of Ser. No. 266,470, June 26, 1972. This application Aug. 5, 1976, Ser. No. 711,965

Claims priority, application Japan, June 24, 1971, 46-46158; Aug. 14, 1971, 46-61776; Aug. 14, 1971, 46-61777; Aug. 18, 1971, 46-62687; Aug. 21, 1971, 46-63885; Aug. 21, 1971, 46-63886

Int. Cl.[2] C07D *499/42*

U.S. Cl. 260—306.7 C **3 Claims**

1. A penam derivative having the formula:



wherein X represents a halogen atom, and wherein R_1 represents an amino, and R_3 represents a radical selected from the group consisting of carboxy, conventional ester, acid amide, acid anhydride, acid halide, acid azide, and acid salt, or a pharmaceutically acceptable salt thereof.

4,036,848

1-THIADIAZOLYL-5-FURFURYL AND TETRAHYDROFURFURYL AMINOIMIDAZOLIDINONES

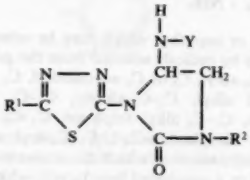
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 15, 1976, Ser. No. 666,717

Int. Cl.[2] C07D *419/00*

U.S. Cl. 260—306.8 D **8 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl

and y is selected from the group consisting of furfuryl and tetrahydofurfuryl.

4,036,849

1-(PARA-SUBSTITUTED-PHENYL)-1H-TETRAZOLES

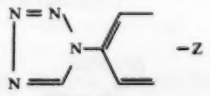
William Vincent Curran, Pearl River, N.Y.; Andrew Stephen Tomcufcik, Old Tappan, N.J., and Adma Schneller Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 470,083, May 15, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,562

Int. Cl.[2] C07D *257/04*

U.S. Cl. 260—308 D **8 Claims**

1. A compound of the formula:



wherein Z is selected from the group consisting of moieties of the formulae:

—SH, —SCH_2X, —$SOCH_2X$ and —SO_2CH_2X

wherein X is selected from the group consisting of hydrogen and chlorine.

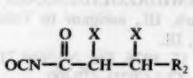
4,036,850

1-ARYL-5-ALKYLIDENE,2,4-DIOXO-IMIDAZOLIDINES AND PROCESS THEREFOR

Edgar Enders, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 5, 1975, Ser. No. 555,661
Claims priority, application Germany, Mar. 26, 1974, 2414613
Int. Cl.[2] C07D *233/04*
U.S. Cl. 260—309.5 12 Claims

1. Process for preparing 1-aryl-5-alkylidene-2,4-dioxomidezolidenes which comprises forming an N-aryl-N'-(2,3-dihalogen alkenoyl)-urea by a process comprising reacting a 2,3-dihalogen alkanoyl isocyanate having the formula



(III)

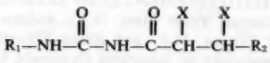
wherein

R_2 is hydrogen, in a solvent at a temperature in the range of from −20 to +50° C with a primary aryl amine of the formula $R_1 - NH_2$

wherein

R_1 is phenyl or naphthyl which may be substituted one or more times by radicals selected from the group of hydrogen, C_1–C_6-alkyl, C_5 or C_6-acycloalkyl, C_1 or C_2-halogen substituted alkyl, C_1–C_6-alkoxy, C_1–C_6 thioalkyl and sulphoxide, C_1–C_6 alkyl sulphone, C_1–C_4 monoalkyl or dialkyl or diarylmonoalkyl, C_1–C_6-acyl amino radical, cyclic amine radical in which the amino nitrogen atom is part of a 5 or 6 membered heterocycle which, in addition, may contain at least one further hetero atom as a ring member, said heterocycle being selected from the group consisting of pyrrolidino, 2-oxopyrrolidino, imidazolino and morpholno; cyano nitro, acetyl, aldehyde, phenyl, phenoxy, halogen phenoxy, nitro phenoxy, phenyl thio, benzyl, anilino, benzyl sulphenyl, phenyl sulphonyl and halogen-benzyl sulphonyl; and converting the urea that results, without intermediate isolation, to the imidazolidine by the process of contacting said N-aryl-N'-(2,3-dihalogen alkanol)-urea with an alkali metal alkoxide in a solvent at a temperature in the range of between 20° C and the boiling point of the solvent.

2. Process for preparing 1-aryl-5-alkylidene-2,4-dioxoimidozolidines which comprises reacting an N-aryl-N'-(2,3-dihalogen alkanoyl)-urea having the formula (II):



(II)

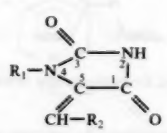
wherein

R_1 and R_2 are as defined in claim **1** and

X is chlorine or bromine,

with an alkali metal alkoxide in a solvent at a temperature in the range of between 20° C and the boiling temperature of the solvent.

12. 1aryl-5-alkylidine-2,4-dioxoimidazolidine having the formula (I):



wherein

R_1 is phenyl, 3,4-dichlorophenyl, 4 -nitro-phenyl, 4-chlorophenyl, 4-ethoxy-phenyl, naphthyl, 2,3-dichlorophenyl, -4-chloro-2-methyl-phenyl, 2,4-dimethyl and phenyl and

R_2 represents hydrogen.

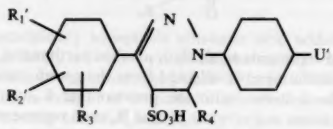
4,036,851

1,3-DIPHENYL SUBSTITUTED PYRAZOLINES

Alec Victor Mercer, Bramhope, and John Stephen Oakland, Morley, both of England, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 23, 1975, Ser. No. 543,325
Claims priority, application United Kingdom, Jan. 29, 1974, 4087/74; May 3, 1974, 19663/74
Int. Cl.[2] C07D *231/08*
U.S. Cl. 260—310 D 24 Claims

1. A compound of the formula:



wherein

R_1', R_2' and R_3', independently, are hydrogen, halogen or C_{1-4} alkyl,

R_4' is hydrogen, C_{1-4} alkyl or phenyl, and U' is $—COOR_6$, $—CONH_2$, SO_2R_9 or SO_2NH_2 where R_6 and R_9 are C_{1-4} alkyl.

4,036,852

OPTICAL RESOLUTION OF PHENYL-GLYCINE AMIDE

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Oct. 20, 1975, Ser. No. 623,928
Claims priority, application Netherlands, Oct. 23, 1974, 7413843
Int. Cl.[2] C07D *207/24*
U.S. Cl. 260—326.45 9 Claims

1. A process for isolating an optically active form of phenyl-glycine amide, from racemic mixtures of the enantiomers of phenyl-glycine amide, comprising providing a racemic mixture of D- and L-phenyl-glycine amide and an optically active form of 2-pyrrolidone-5-carboxylic acid; treating said racemic mixture with the 2-pyrrolidone-5-carboxylic acid to form the corresponding salts of said optically active 2-pyrrolidone-5-carboxylic acid and said enantiomers; and separating from the mixture an optically active form of phenyl-glycine amide in the form of a salt of said 2-pyrrolidone-5-carboxylic acid.

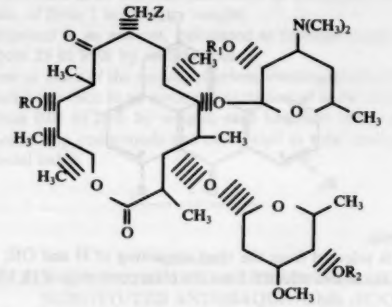
4,036,853

SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES-C_8 MODIFICATIONS

Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,360
Int. Cl.[2] C07D *313/00*
U.S. Cl. 260—343 6 Claims

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

Z is $-OR_4$;

R_4 is selected from the group consisting of hydrogen and alkanoyl having from two to six carbon atoms.

4,036,854

METHOD FOR PREPARING COUMARIN

Kuo Yuan Chang, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 555,472, March 5, 1975. This application Apr. 26, 1976, Ser. No. 680,244

Int. Cl.[2] C07D *311/10*

U.S. Cl. 260—343.2 R **4 Claims**

1. A method of preparing coumarin by reacting salicylaldehyde, 1 to about 4 moles of acetic anhydride per mole of salicylaldehyde and an alkali metal acetate wherein the molar concentration of the alkali metal acetate is at or below the concentration of salicylaldehyde in the reaction, said reaction being conducted at temperatures up to 200° C for between about 2 and about 10 hours, the improvement comprising draining the liquid contents of the reactor through a filter medium located at the base of the reactor while passing an inert gaseous medium through said filter, to thereby retain the crystalline alkali metal acetate in the reactor, adding salicylaldehyde and acetic anhydride to the reactor and repeating the conversion thereof to coumarin without prior removal of the alkali metal acetate from the reactor.

4,036,855

PHTHALIDES AND PROCESS FOR PREPARING SAME

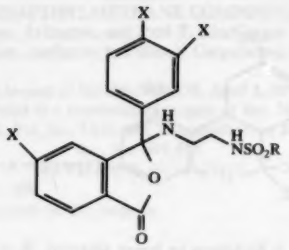
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 409,923, Oct. 26, 1973, Pat. No. 3,943,147, which is a continuation-in-part of Ser. No. 342,879, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 333,499, Feb. 20, 1973, abandoned. This application Oct. 29, 1975, Ser. No. 626,784

Int. Cl.[2] C07D *307/87*; A01N *9/28*

U.S. Cl. 260—343.3 R **8 Claims**

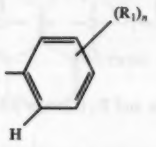
1. A compound of the formula



where

X represent H or halo of atomic weight 19 to 36, and

R represents lower alkyl, or



where

R_1 represents H, straight chain lower alkyl having 1 to 3 carbon atoms, or halo of atomic weight 35 to 80, and

n is 1 or 2.

4,036,856

CYCLOPENTANONE DERIVATIVES

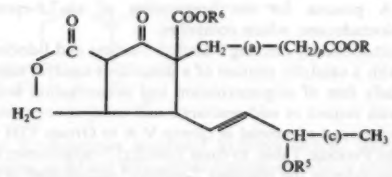
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 489,856, July 19, 1974, which is a division of Ser. No. 238,650, March 27, 1972, Pat. No. 3,849,474. This application Nov. 11, 1976, Ser. No. 741,096

Int. Cl.[2] C07D *307/88*

U.S. Cl. 260—343.3 R **2 Claims**

1. A compound of the formula



in which (a) is CH_2CH_2, *p* is an integer from 2 to 4, (c) is $(CH_2)_q$ wherein *q* is an integer from 1 to 6, R, and R^6 each are lower alkyl and R^5 is hydrogen.

4,036,857

BENZOPYRANS HAVING AN UNSATURATED SIDE CHAIN

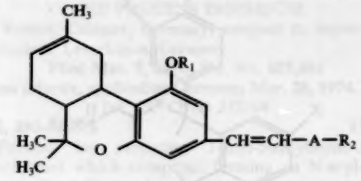
Raj Kumar Razdan, Belmont, and Haldean Cloyce Dalzell, Weston, both of Mass., assignors to Sharps Associates, Cambridge, Mass.

Filed Feb. 2, 1976, Ser. No. 654,158

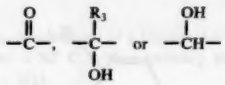
Int. Cl.[2] C07D *307/83*

U.S. Cl. 260—345.3 **12 Claims**

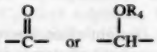
1. A compound of the formula



wherein R_1 is hydrogen or lower alkanoyl, R_2 is a C_1 to C_{20} alkyl, aryl-lower alkyl or cycloalkyl-lower alkyl, A represents



when R_1 is hydrogen and R_3 is lower alkyl, and A is



when R_1 is lower alkanoyl and R_4 is the same lower alkanoyl represented by R_1.

4,036,858

PROCESS FOR THE PREPARATION OF 7,8-EPOXY-2-METHYLOCTADECANE

Friedrich-Wilhelm Küpper, and Roland Streck, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed July 7, 1976, Ser. No. 703,268

Claims priority, application Germany, July 17, 1975, 2531959

Int. Cl.[2] C07D *301/14*

U.S. Cl. 260—348.5 L **9 Claims**

1. A process for the preparation of cis-7,8-epoxy-2-methyloctadecane, which comprises:

a. metathetically reacting 7-methyl-1-octene and 1-dodecene with a catalytic amount of a metathesis catalyst substantially free of oligomerization and isomerization activity with respect ot said reactants, said catalyst comprising a compound of a metal in Group V A to Group VIII A of the Periodic Table, to form 2-methyl-7-octadecene; and

b. epoxidizing the resultant 2-methyl-7-octadecene to form said cis-7,8-epoxy-2-methyloctadecane.

4,036,859

METHOD FOR THE PREPARATION OF 2-HYDROXYBENZANTHRONE COMPOUNDS

Giuseppe Ribaldone, Gallarate (Varese), and Giampiero Borsotti, Novara, both of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

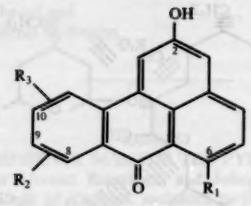
Filed June 22, 1976, Ser. No. 698,362

Claims priority, application Italy, June 24, 1975, 24696/75

Int. Cl.[2] C09B *3/02, 3/04, 1/00*

U.S. Cl. 260—364 **10 Claims**

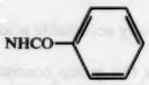
1. A process for the preparation of a compound having the general formula:



(I)

wherein:

R_1 is selected from the class consisting of H and OH; and R_2 and R_3 are selected from the class consisting of H, Cl, OH, OCH_3 and



characterized in that an anthraquinone-1-diazonium salt is reacted with an olefinic compound of the formula:

wherein X = CN or $OCOCH_3$, in an alcoholic medium of a lower monovalent alcohol and in the presence of a catalytic quantity of cuprous chloride, at a temperature between 20° and 100° C, and that the reaction intermediate thus obtained is reacted successively with alkali in alcoholic solution to produce said compound.

4,036,860

PRODUCTION OF ANTHRAQUINONE

Heinz Engelbach, Limburgerhof, and Michael Jolyon Sprague, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

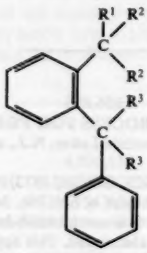
Filed Aug. 25, 1975, Ser. No. 607,356

Claims priority, application Germany, Sept. 7, 1974, 2442911

Int. Cl.[2] C09B *1/00*

U.S. Cl. 260—369 **13 Claims**

1. A process for the production of anthraquinone by the oxidation of a diphenylmethane derivative with oxygen in the gaseous phase in the presence of a pentavalent vanadium compound as a catalyst at elevated temperature which comprises oxidizing a diphenylmethane compound of the formula (I):



(I)

in which R^1, R^2 and R^3 are identical or different and each is hydrogen or an aliphatic radical, in the presence of oxygen-containing compounds of

a. vanadium in an amount, calculated as vanadium pentoxide, of from 1 to 70% by weight;
b. titanium in an amount, calculated as titanium dioxide, of from 29 to 95% by weight; and
c. one or more of the metals tellurium, caesium, thallium and antimony each in an amount, calculated as metal oxide, of from 0.01 to 20% by weight, each based on the oxygen-containing compounds and calculated as total amount of metal oxide.

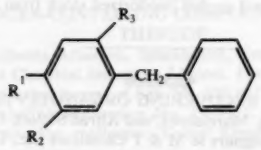
4,036,861

PROCESS FOR PRODUCING A 2-TERTIARY-ALKYL SUBSTITUTED ANTHRAQUINONE

Shizuo Togo; Muneo Ito; Chiharu Nishizawa, and Michio Ohba, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed June 17, 1976, Ser. No. 696,835
Claims priority, application Japan, June 25, 1975, 50-79281
Int. Cl.[2] C09B *1/00*
U.S. Cl. 260—369 **10 Claims**

1. A process for producing a 2-tertiary-alkyl substituted anthraquinone, characterised by carrying out catalytic oxidation of a diphenylmethane compound having the formula



I

wherein R_1 and R_2 are different from each other, and independently hydrogen or tertiary-alkyl having 4 and 5 carbon atoms with the proviso that one of R_1 and R_2 is hydrogen, and R_3 is alkyl having 1 – 3 carbon atoms, in vapor phase in the presence of a catalyst comprising vanadium oxide.

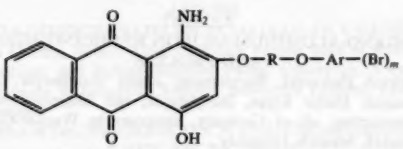
4,036,862

1-AMINO-2-(BROMOPHENOXY-ALKOXY)-4-HYDROXY ANTHRAQUINONE DYESTUFFS

Volker Hederich, Cologne; Hans-Samuel Bien, Burscheid, and Günter Gehrke, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 30, 1975, Ser. No. 618,247
Claims priority, application Germany, Oct. 5, 1974, 2447610; May 30, 1975, 2524126
Int. Cl.[2] C07C *97/26*
U.S. Cl. 260—380 **4 Claims**

1. Mixtures of water-insoluble anthraquinone dyestuff of the formula



wherein
R is straight-chain C_2–C_6-alkylene;
Ar is phenyl or C_1–C_2-alkylphenyl; and
m is 0.2 to 0.8.

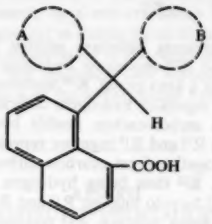
4,036,863

TRINAPTHYLMETHANE COMPOUNDS

Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 456,870, April 1, 1974, Pat. No. 3,976,662, which is a continuation-in-part of Ser. No. 202,615, Nov. 26, 1971, Pat. No. 3,816,453. This application June 1, 1976, Ser. No. 691,889
Int. Cl.[2] C07C *39/14, 39/16*
U.S. Cl. 260—386 **13 Claims**

1. A compound of the formula:



wherein A represent 4'-hydroxy-1'-napthyl and B represents 4'-hydroxy-1'-naphthyl.

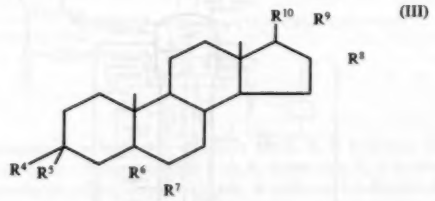
4,036,864

CHEMICAL PROCESS

Derek Harold Richard Barton, London, England, and Robert Henry Hesse, Cambridge, Mass., assignors to Research Institute for Medicine and Chemistry Inc., Cambridge, Mass.

Filed May 27, 1975, Ser. No. 581,283
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—397.3 **25 Claims**

1. A process for the 9α-electrophilic fluorination of a saturated steroid compound containing a hydrogen atom bound to a tertiary carbon atom, wherein said steroid has a formula:

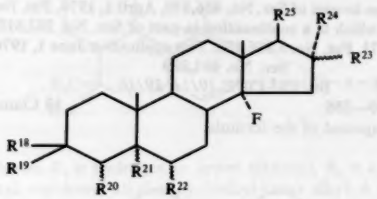


(III)

where R^4 represents protected hydroxy and R^5 represents hydrogen, or R^4 and R^5 together represent a keto or protected keto group, and R^6 and R^7 each represent hydrogen, or R^4 and R^6 together represent a 3,5-cyclo linkage, R^5 represents hydrogen and R^7 represents protected hydroxy; R^8 represents hydrogen, methyl or protected hydroxy; R^9 represents hydrogen, hydroxy or protected hydroxy and R^{10} represents acetyl or substituted acetyl, or R^9 represents hydrogen and R^{10} represents protected hydroxy, or R^9 and R^{10} together represent a keto group; which comprises reacting the said steriod with an electrophilic fluorinating agent selected from the group consisting of molecular fluorine, pentafluorosulphur hypofluorite and lower fluoroalkyl hypofluorites in which the fluoroalkyl moiety contains at least two fluorine atoms per carbon atom, said fluorinating agent being substantially homogeneously dispersed in a liquid medium and said reaction being conducted in the presence of a free radical inhibitor to suppress formation of free fluorine radicals so that said hydrogen atom is electro-

philically replaced by a fluorine atom, and recovering the thus-obtained fluoro steroid.

22. A compound having the formula:



(IX)

wherein R^{18} represents hydroxy, nitroxy, acetoxy or trifluoroacetoxy and R^{19} represents hydrogen or R^{18} and R^{19} together represent a keto group, R^{20} represents hydrogen and R^{21} and R^{22} both represent hydrogen, chlorine or bromine or together form a carbon-carbon double bond or an epoxy group, and when R^{18} and R^{19} together represent a keto group R^{20} and R^{21} may together form a carbon-carbon double bond or an epoxy group, R^{22} then being hydrogen, or R^{18} and R^{21} together form a 3,5-cyclo linkage, R^{19} and R^{20} then being hydrogen and R^{22} being acetoxy; R^{23} represents hydrogen or methyl; R^{24} represents hydrogen or hydroxy and R^{25} represents acetoxy, or R^{24} and R^{25} together represent a keto group.

4,036,865

SEMICONTINUOUS PROCESS FOR DEODORIZING OILS

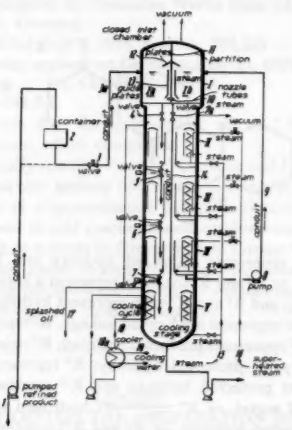
Albert Hartmann, Heusenstamm; Herbert Schilken, Friedberg, and Bernhard Romeiser, Hanau, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 485,290, July 2, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,337

Claims priority, application Germany, July 18, 1973, 2336639

Int. Cl.² C11B *3/14*

U.S. Cl. 260—428 **3 Claims**



1. A semicontinuous process for deodorizing liquid feed stock containing oil, comprising the steps of:

a. introducing the feed stock initially into a first evacuated chamber having a wall and a partition parallel to but spaced from said wall, introducing steam upwardly into said chamber at the base of said partition and between said partition and a first guide plate, parallel to and between said wall and said partition, to induce a circulation of the feed stock in said chamber, introducing deodorized stock into a second chamber adjacent said evacuated chamber and separated therefrom by said partition, and circulating said deodorized stock in said second chamber by introducing steam upwardly into a space between said partition and a second guide plate parallel to said partition and spaced from said first guide plate by said partition, said circulating deodorized stock indirectly heating said feed stock through said partition in heat exchanging relationship;

b. deodorizing the feed stock by intermittently passing the feed stock heated in step (a) through a succession of heating stages at subatmospheric pressure, each stage having a wall and a partition parallel to but spaced from said wall, while admitting steam at the base of the partition between the wall and the partition in each of said stages to circulate the feed stock therein between the wall and the partition and so as to heat the feed stock in said succession of stages to successively higher temperatures thereby deodorizing said feed stock;

c. withdrawing the feed stock from at least one of said heating stages subsequent to the first heating stage and passing it as said deodorized stock into said second chamber for indirect heat exchange with the initial feed stock in step (a);

d. withdrawing deodorized stock from said second chamber and cooling said withdrawn deodorized stock in a cooling stage; and

e. discharging said cooled deodorized stock from said cooling stage.

4,036,866

PROCESS FOR RECOVERING ORGANOTIN HALIDES

William A. Larkin, Morristown, and Alfred Stoloff, Livingston, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 499,503, Aug. 22, 1974, Pat. No. 3,931,264. This application Oct. 14, 1975, Ser. No. 622,374

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **11 Claims**

1. A method for isolating an organotin halide of the general formula $(CH_3)_aSnX_{4-a}$ or $C_4H_9SnX_3$, wherein *a* is the integer 2 or 3 and X represents chlorine, bromine or iodine, in substantially pure form from an aqueous medium containing more than about (55%) by weight of said organotin halide in the form of a water-insoluble complex with ammonia or an amine, the method consisting essentially of the following steps:

1. combining said aqueous medium with (a) an amount of a chemically inert water-soluble, inorganic salt sufficient to attain a concentration of from 50 g. of said salt per 100 cc. of water up to the concentration equivalent to a saturated or super-saturated solution of said salt, and (b) a non-oxidizing mineral acid in an amount sufficient to completely decompose said complex;
2. heating the resultant solution to a temperature between ambient and the boiling point of the solution as required to effect a separation of the organotin halide from the aqueous phase;
3. isolating the organotin halide.

4,036,867

ORGANO-ALUMINUM-SILICON REDUCING AGENTS AND PROCESS

Gottfried Piekarski, Burghausen; Anton Hundmeyer, Burghausen; Dieter Kippe, Burghausen, and Siegmund Maier, Emmerting, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Mar. 24, 1975, Ser. No. 561,026

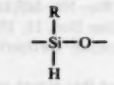
Claims priority, application Germany, Mar. 27, 1974, 2414875

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 A **16 Claims**

1. A process for the production of an organo-aluminum-sili-

con reducing agent consisting essentially of reacting a hydrogenpolysiloxane having a viscosity of from 5 to 100 cST at 25° C and at least two siloxane units having the formula



wherein R is a member selected from the group consisting of alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 5 to 6 carbon atoms and phenyl, said hydrogenpolysiloxane having the three valences of its silicon atoms on the ends of the polysiloxane chain satisfied by R, hydrogen or, at most, one hydroxyl group per end silicon atom, with a dialkyl aluminum hydride having from 2 to 8 carbon atoms in each of the alkyls, at a temperature not exceeding 80° C and in a molar ratio of from 0.8 to 2 mols of said siloxane units per mol of said dialkyl aluminum hydride, and recovering said organo-aluminum reducing agent.

4,036,868

NITROGEN-CONTAINING COMPOUNDS AND USE THEREOF

John Heathcote Atherton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 329,337, Feb. 5, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 542,048

Claims priority, application United Kingdom, Feb. 7, 1972, 5494/72

Int. Cl.[2] C07F *7/10, 7/18*

U.S. Cl. 260—448.2 N **16 Claims**

1. Organopolysiloxanes (A) consisting of 0.18 to 14 mole percent of units of the formula:

$$OSi(R)C_dH_{2e}CH_2N(R^{iv})Si(R)O, \quad (I)$$

0 to 0.1 mole percent of units of the formula:

$$OSi(R)NHCH_2C(R'')=CH_2 \quad (II)$$

and 0 to 50 mole percent of units of the formula:

$$OSi(R)C_dH_{2e}CH_2NH(R^{iv}) \quad (III)$$

the remaining units being selected from the group consisting of $R_3SiO_{1/2}$ and $R_eH_fSiO_{(4-e-f)/2}$ units where R is a monovalent hydrocarbon group, R'' is hydrogen or a methyl group, R^{iv} is hydrogen or an alkyl group having up to 6 carbon atoms, d is 2 or 3, e is 1 or 2, f is 0 or 1 and $e + f$ is 2.

4,036,869

2,4-DIISOCYANATO BICYCLO (3,3,0)-OCT-6-ENE

John Crosby; Robert Allan Campbell Rennie, both of Runcorn, England, and Robert Michael Paton, Edinburgh, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 638,655, Dec. 8, 1975. This application Nov. 8, 1976, Ser. No. 740,244

Claims priority, application United Kingdom, Dec. 11, 1974, 53551/74

Int. Cl.[2] C07C *119/045*

U.S. Cl. 260—453 AP **1 Claim**

1. 2,4-diisocyanato bicyclo (3,3,0)-oct-6-ene.

4,036,870

AMMOXIDATION OF ALKANES

George Augustus Castellion, and William Frank Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 2, 1971, Ser. No. 159,570

Int. Cl.[2] C07C *120/14*

U.S. Cl. 260—465.3 **6 Claims**

1. A catalytic process for making α,β-ethylenically-unsaturated lower aliphatic nitrile, said process comprising contacting a gas mixture comprising reactants ammonia, oxygen and lower alkane hydrocarbon having 3 to 4 carbon atoms, with a solid catalyst consisting essentially of mixed bismuth oxide and molybdenum oxide with at least said molybdenum oxide present entirely as a non-crystalline solid phase with phosphoric acid present as fluxing agent in said non-crystalline phase at reaction temperature in the range from about 400°C. to about 600°C. and residence time sufficient to effect the catalytic conversion of the lower alkane hydrocarbon to said nitrile.

4,036,871

11-SUBSTITUTED PROSTAGLANDINS

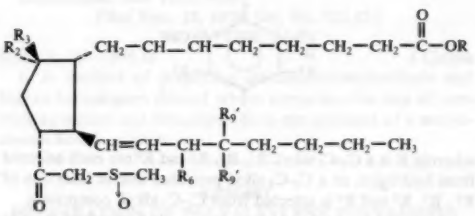
George William Holland, Cedar Grove; Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 480,458, June 18, 1974, which is a continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application Sept. 17, 1975, Ser. No. 614,044

Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—468 D **3 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_2 is hydroxy; R_3 is hydrogen or taken together with R_2 forms oxo; R_6 is hydroxy, tetrahydropyranyloxy benzyloxy, 4-methoxy-5,6-dihydro-2H-pyranyloxy, benzhydryloxy, trityloxy, trialkylsilyloxy and methoxymethyl; R_9 is hydrogen, lower alkyl or fluoro;

R_9' is hydrogen or lower alkyl; and the dotted carbon to carbon bond can be optionally hydrogenated

or enatiomers or racemates.

4,036,872

CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster; Edward Charles John Coffee, London, and Gordon Leonard Watkins, Hornchurch, all of England, assignors to May & Baker Limited, Dagenham, England

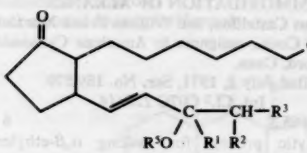
Filed Nov. 12, 1974, Ser. No. 523,015

Claims priority, application United Kingdom, Nov. 13, 1973, 52695/73

Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—468 D **9 Claims**

1. A cyclopentane derivative of the formula:



wherein R^1 represents alkyl of 1 through 4 carbon atoms, R^2 represents hydrogen or alkyl of 1 through 3 carbon atoms, R^3 represents alkoxy of 3 through 6 carbon atoms, R^4 represents hydrogen or alkyl of 1 through 12 carbon atoms and R^5 represents hydrogen or alkyl of 1 through 4 carbon atoms or a carboxylic acyl group and, where R^4 represents a hydrogen atom, non-toxic pharmaceutically-acceptable salts thereof.

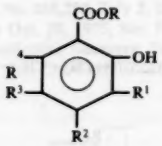
4,036,873

PREPARATION OF ALKYL SUBSTITUTED o-HYDROXYBENZOIC ACID ESTERS

Clarence W. Huffman, Clark, N.J., assignor to IMC Chemical Group, Inc., Newark, N.J.

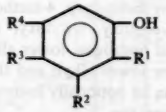
Filed Mar. 7, 1975, Ser. No. 556,476
Int. Cl.² C07G 69/76
U.S. Cl. 260—473 S **21 Claims**

1. Process for preparing an alkyl substituted o-hydroxy benzoic acid ester of the general formula:



wherein R is a C_1-C_5 alkyl, R^1, R^2, R^3 and R^4 are each selected from hydrogen, or a C_1-C_3 alkyl provided that at least one of R^1, R^2, R^3 and R^4 is selected from C_1-C_3 alkyl, comprising

a. reacting in an aqueous media an alkali metal hydroxide with a phenolic compound having the general formula:



wherein R^1, R^2, R^3 and R^4 are the same as above to form an alkali metal phenolate;

b. transferring said phenolate into an organic carrier to form a substantially anhydrous phenolate-organic carrier mixture;

c. carboxylating said phenolate by contacting said mixture with sufficient CO_2 at substantially atmospheric pressures to form a dialkali metal salt;

d. half-neutralizing said salt by contacting the resultant salt-organic carrier mixture with about one equivalent of a substantially anhydrous inorganic acid per mole of salt; and

e. reacting said salt in said organic carrier with at least about 1 mole of a C_1-C_5 alkyl chloride per mole of salt.

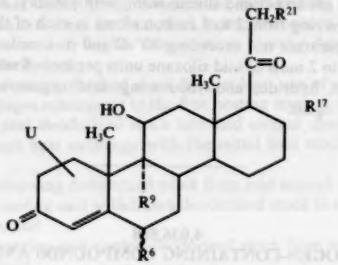
4,036,874

D-HOMOPREGNANES

Leo Alig, Liestal; Andor Fürst, Basel, and Marcel Müller, Frenkendorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 345,149, March 26, 1973, abandoned. This application Dec. 11, 1975, Ser. No. 639,939
Claims priority, application Switzerland, Mar. 29, 1972, 4666/72
The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.
Int. Cl.² C07J 63/00
U.S. Cl. 260—488 B **16 Claims**

1. A compound of the formula



wherein R^6 is hydrogen, fluorine, chlorine or methyl and R^9 is hydrogen, fluorine, chlorine, or bromine with the provisos that R^6 and R^9 simultaneously are not hydrogen and R^6 is a group other than methyl when R^6 is hydrogen when U is hydrogen attached to each of the 1- and 2-positions of the steroid nucleus; R^{17} and R^{21} each independently are hydroxy or alkanoyloxy of up to 6 carbon atoms, and U is hydrogen attached to each of the 1- and 2-positions of the steroid nucleus or an additional single bond between the 1- and 2-positions of the steroid nucleus.

4,036,875

PROCESS FOR THE CONTINUOUS SULPHONATION OF ALKYL AROMATIC HYDROCARBONS

Anders Broström, Goteborg, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

Filed June 2, 1975, Ser. No. 583,319
Claims priority, application Sweden, June 5, 1974, 7407422
Int. Cl.² C07C 143/24
U.S. Cl. 260—505 S **6 Claims**

1. In the process for the continuous sulphonation of an alkyl aromatic hydrocarbon in the liquid phase with sulphur trioxide gas in an elongated reaction zone, the point of introduction of such sulphur trioxide gas being the start of the reaction zone, and the point of withdrawal of the reaction product being the end of the reaction zone, the improvement which comprises limiting the amount of sulphur trioxide introduced initially at the start of the reaction zone into the liquid phase to be sulphonated to not exceeding 7% of the stoichiometric amount required for the desired sulphonated product, and distributing the introduction of the remaining stoichiometric amount of sulphur trioxide gas over from about 20 to about 80% of the remainder of the length of the reaction zone.

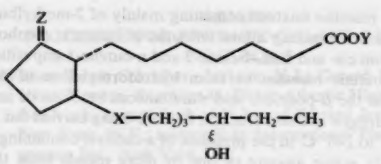
4,036,876

18- AND 19-HYDROXYLATED PROSTAGLANDINS

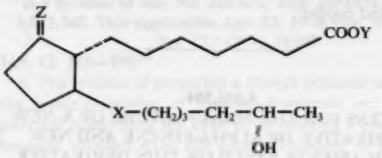
Raymond P. Lanzilotta, San Jose, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed July 13, 1973, Ser. No. 379,128
Int. Cl.² C07C 177/00
U.S. Cl. 260—514 D **5 Claims**

1. The compounds of the formulas:



(I)



(II)

wherein X is a cis unsaturated carbon-carbon double bond, —CH=CH—;

Y is selected from the group consisting of hydrogen, lower alkyl or a pharmaceutically acceptable salt;

Z is selected from the group consisting of keto and

and the wavy line (ξ) is a mixture of the (R) and (S) antimers.

4,036,877

PROCESS FOR THE PRODUCTION OF ALDEHYDES

József Petró; Tibor Máthé, and Antal Tungler, all of Budapest, Hungary, assignors to Budapesti Muszaki Egyetem, Budapest, Hungary

Filed Feb. 12, 1975, Ser. No. 549,143

Int. Cl.[2] C07C *63/00, 47/52, 47/54*

U.S. Cl. 260—515 R **1 Claim**

1. In a process for the preparation of aldehydes by hydrogenating carboxylic acid chlorides of the general formula RCOCl wherein R stands for phenyl or substituted phenyl group, the substituents being alkyl, halogen, hydroxy, alkoxy, carboxyl, carbonyl or nitro groups, the improvement which comprises conducting the hydrogenating reaction in the presence of an alloy catalyst consisting of at least one element of the platinum group and selected from the group consisting of palladium, platinum, rhodium, and osmium, and at least one element of the groups IB and IIB of the periodic system and selected from the group consisting of copper, silver, gold, cadmium, and mercury, on a carrier selected from the group consisting of activated carbon, silica, alumina and calcium carbonate at a temperature from about 0° to 190° and at a pressure of about 1 to 50 atmospheres.

4,036,878

PROCESS FOR PREPARING UREA

Petrus J.C. Kaasenbrood, Sittard, and Petrus J.M. Van Nassau, Munstergeleen, both of Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Continuation of Ser. No. 369,388, June 12, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,417

Claims priority, application Netherlands, June 12, 1972, 7207941

Int. Cl.[2] C07C *126/00*

U.S. Cl. 260—555 A **6 Claims**

1. In a process for synthesizing urea by reacting carbon dioxide and ammonia at a pressure of 80–200 atm. and a temperature of 170°–190° C. in a urea synthesis zone, heating the thus-produced urea synthesis solution and contacting said solution with a stripping gas, thereby forming a gaseous mixture composed primarily of ammonia, carbon dioxide and water vapor, and recirculating said gaseous mixture, said heating and contacting being effected at substantially the same pressure as that maintained in the urea synthesis zone, the improvement comprising:

a. in a first step, increasing the temperature of said urea synthesis solution by said heating to a temperature of 205°–250° C. in a heat exchange zone thereby liberating a mixture of gases prior to contact with said stripping gas, and

b. in a second step, effecting said contacting of the heated synthesis solution of the first step (a) with said stripping gas under substantially adiabatic conditions, thereby removing and expelling the unconverted reactants with said stripping gas.

4,036,879

CATALYSTS FOR THE HYDRATION OF NITRILES OF AMIDES

Clarence E. Habermann, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 91,146, Nov. 19, 1970, abandoned. This application June 6, 1975, Ser. No. 584,315

Int. Cl.[2] C07C *103/133*

U.S. Cl. 260—561 N **6 Claims**

1. In the process of hydrating a nitrile to the corresponding amide by contacting the nitrile in the presence of water with a catalyst, the improvement comprising using as catalyst reduced silver oxide, reduced nickel-chromium oxide, reduced iron-chromium oxide or mixture thereof.

4,036,880

METHOD OF PREPARING POLYAMINOPOLYPHENYLMETHANES

Edward T. Marquis; Robert M. Gipson, and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Sept. 15, 1976, Ser. No. 723,422

Int. Cl.[2] C07C *85/24*

U.S. Cl. 260—570 D **4 Claims**

1. A method of preparing diaminodiphenylmethane and higher homologues thereof which comprises the step of condensing aniline and formaldehyde in the presence of a molybdenum boride catalyst.

4,036,881

PREPARATION OF POLYALKYLENE POLYAMINES

Michael E. Brennan, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

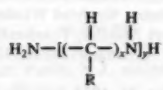
Filed June 2, 1975, Ser. No. 583,017

Int. Cl.[2] C07C *87/20*

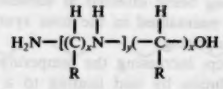
U.S. Cl. 260—583 P **8 Claims**

1. A process for preparing predominantly noncyclic polyalkylene polyamines comprising the steps of:

contacting an alkyleneamine compound having two primary amino groups of the general formula:



wherein R is a hydrogen or a lower alkyl radical, x is a number from 2 to about 6 and y is a number from 1 to about 4 with an alkanolamine compound having a primary amino group and a primary or secondary hydroxy group of the general formula:



wherein R is a hydrogen or a lower alkyl radical; *x* is a number from 2 to about 6; and, *y* is a number from 0 to about 3 in the presence of a catalytically effective amount of a phosphorus-containing substance selected from the group consisting of acidic metal phosphates, phosporic acid compounds and their anhydrides, phosphorous acid compounds and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous and phosphoric acids wherein said alkyl groups have from 1 to about 8 carbon atoms and said aryl groups have from 6 to about 20 carbon atoms, alkali metal monosalts of phosphoric acid, the thioanalogs of the foregoing, and mixtures of the above at temperatures of from about 250° to about 350° C under a pressure sufficient to maintain the mixture essentially in liquid phase, and,

recovering said polyalkylene polyamines from the resultant reaction mixture.

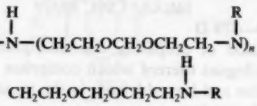
4,036,882

AMINE FORMAL POLYMERS AND PROCESS OF MAKING THE SAME

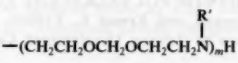
Eugene R. Bertozzi, Yardley, Pa.; Robert Barclay, Jr., Trenton, N.J.; David H. Packer, Yardley, and Daniel J. Smith, Washington Crossing, both of Pa., assignors to Thiokol Corporation, Newtown, Pa.

Filed Feb. 13, 1974, Ser. No. 441,938
Int. Cl.[2] C07C *93/02, 85/04*
U.S. Cl. 260—584 B **10 Claims**

1. An amine formal polymer of the general formula



wherein R is hydrogen, —CH_2R'' or



R′ is hydrogen or —CH_2R'' and R″ is hydrogen, alkyl or hydroxyalkyl, in which the alkyl groups have 1 to 6 carbon atoms, *n* is 1 to 8, *m* is 0 to 8 and R, R′ and R″ may be the same or different, said polymer having a primary amine content, expressed as nitrogen, of about 5 to 7% by weight.

4,036,883

MANUFACTURE OF ISOMER-FREE 3-METHYLBUTYLAMINE

Dieter Voges, Mannheim; Siegfried Winderl, Heidelberg-Wieblingen, and Herbert Mueller, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 21, 1975, Ser. No. 634,232
Claims priority, application Germany, Nov. 27, 1974, 2456006
Int. Cl.[2] C07C *85/06;* C07B *1/00*
U.S. Cl. 260—585 B **4 Claims**

4. A process for the production of pure 3-methylbutylamine-1 which comprises reacting hydrogen and ammonia simultaneously with a hydroformylation reaction mixture derived by the thermal condensation of isobutene and aqueous formaldehyde, said reaction mixture consisting mainly of 2-methylbuten-1-ol-4 and containing minor amounts of isomeric alcohols derived from cis- and trans-butene-2 and n-butene-1 impurities in the isobutene reactant or from hydroformylation of the isobutene at the β-position, said simultaneous reaction of ammonia, hydrogen and said reaction mixture being carried out at about 140° to 240° C. in the presence of a catalyst containing a catalytically active amount of one or more metals from the group consisting of iron, nickel, cobalt, ruthenium, rhodium, platinum and copper.

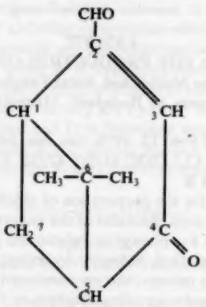
4,036,884

PROCESS FOR THE MANUFACTURE OF A NEW DERIVATIVE OF ALPHA-PINENE AND NEW MEDICAMENTS BASED ON THIS DERIVATIVE

Raymond Dulou, Paris; Pierre Magnin, Clermont-Ferrand, and Pierre Bechtel, Besancon, all of France, assignors to So. Ci. Bre., Nanterre, France

Continuation of Ser. No. 420,149, Nov. 29, 1973, abandoned, which is a continuation of Ser. No. 222,004, Jan. 31, 1972, abandoned. This application Aug. 11, 1975, Ser. No. 603,523
Claims priority, application France, Feb. 4, 1971, 71.03753
Int. Cl.[2] A61K *31/18;* C07C *45/00, 49/00*
U.S. Cl. 260—586 G **1 Claim**

1. The novel chemical compound: 6,6-dimethyl-4-oxo-2-formylbicyclo [3.1.1]hept-2-ene of the formula:



4,036,885

METHOD FOR DECOMPOSING AN AROMATIC ALDEHYDE-HYDROGEN FLUORIDE-BORON FLUORIDE COMPLEX

Susumu Fujiyama; Minoru Takagawa, and Shiro Kajiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 468,025, May 8, 1974, Pat. No. 3,962,343. This application Feb. 2, 1976, Ser. No. 654,625
Claims priority, application Japan, May 25, 1973, 48-58333
The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.
Int. Cl.[2] C07C *45/24*
U.S. Cl. 260—599 **7 Claims**

1. A method for decomposing an aromatic aldehyde-hydrogen fluoride-boron trifluoride complex, which comprises effecting decomposition of said complex by contacting the complex with benzene as a diluent at a pressure of from about 1 to about 10 atmospheres at a temperature of from about 40° to about 130° C. in such a short time as not to cause a change in the quality of the aromatic aldehyde, separating hydrogen fluoride and boron trifluoride as a gaseous phase from said complex and said aromatic aldehyde as a liquid phase.

4,036,886

PROCESSES FOR PRODUCING 4- AND 5-PHENYL PENTENALS

William Lewis Schreiber, Jackson, N.J.; Gerard Joseph Mosciano, Newton, Pa.; Alan O. Pittet, Atlantic Highlands; Manfred Vock, Locust, both of N.J., and Edward Joseph Shuster, New York, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

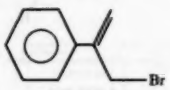
Continuation-in-part of Ser. No. 507,542, Sept. 19, 1974, which is a division of Ser. No. 283,632, Aug. 25, 1972, Pat. No. 3,862,340. This application Apr. 12, 1976, Ser. No. 676,393

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—599 1 Claim

1. The process of preparing a phenyl pentenal selected from the group consisting of 5-phenyl-4-pentenal and 4-phenyl-4-pentenal comprising the steps of (i) reacting a phenyl alkenyl bromide selected from the group consisting of phenyl allyl bromide having the structure:

and α-bromomethyl styrene having the structure:



with the lithium salt of a Schiff base of acetaldehyde with an organic amine thereby forming a 4- or 5-phenyl-4-pentenal Schiff base, the temperature range of the reaction between the phenyl alkenyl bromide and the Schiff base being from −70° C up to +30° C, and (ii) subsequently acidifying the resultant 4- or 5-phenyl-4-pentenal Schiff base at a pH of approximately 1 with an acid selected from the group consisting of hydrochloric acid and sulfuric acid.

4,036,887

PREPARATION OF 3-BROMOBENZALDEHYDE

Roger A. Sheldon; Johannes W. van der Meer; Pieter A. Verbrugge, and Albertus J. Mulder, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 25, 1976, Ser. No. 689,758

Claims priority, application United Kingdom, June 2, 1975, 23771/75

Int. Cl.[2] C07C *47/55*

U.S. Cl. 260—599 2 Claims

1. A process for preparing 3-bromobenzaldehyde, which comprises treating, under essentially anhydrous and molecular oxygen-free conditions at a temperature below 100° C, a mixture of benzaldehyde and aluminum chloride, said mixture being at least partially in solution in a lower polar chloroalkane, with a solution of bromine chloride in said chloroalkane, slowly, at a controlled rate, the mole ratio of aluminum chloride-to-benzaldehyde being within the range of from 1.2/1 to 1.5/1 and the molar ratio of benzaldehyde-to-bromine chloride being from 1/1 to 1/1.5.

4,036,888

PROCESS FOR THE PRODUCTION OF HYDROXY-PIVALDEHYDE

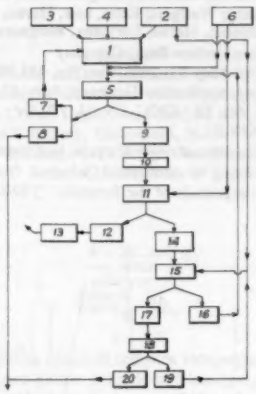
Pierre Couderc, Bethune, and Serge Hilmoine, Aire-sur-la-Lys, both of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Oct. 23, 1975, Ser. No. 625,074

Claims priority, application France, Oct. 30, 1974, 74.36346

Int. Cl.[2] C07C *47/26*

U.S. Cl. 260—602 8 Claims



1. A process for the recovery of hydroxy-pivaldehyde from a mixture containing 42 to 50wt% of hydroxy-pivaldehyde, 28 to 35wt% of isobutyraldehyde, approximately 18wt% of water, approximately 2wt% of triethylamine, and approximately 2wt% of secondary reaction products, said mixture produced by reacting formaldehyde with isobutyraldehyde in an approximate molar ratio of 1:2 in the presence of a catalyst amount of triethylamine, the formaldehyde being in the form of about 40% aqueous solution, the reaction being conducted at a sufficient temperature and for a sufficient time to produce said reaction mixture, the recovery comprising:

a. adding at least one part by weight of water to 1 part of the reaction mixture, distilling the solution obtained under reduced pressure at a temperature below 65° C, to produce a distillate containing isobutyraldehyde, triethylamine and water, and a concentrate of an aqueous solution containing hydroxy-pivaldehyde,

b. cooling the concentrate of the aqueous solution containing hydroxy-pivaldehyde to approximately 15° to 20° C to cause the crystallization of hydroxy-pivaldehyde, filtering off the resultant crystals from the mother liquor, washing the crystals with cold water and then drying the crystals in air, and

c. subjecting the mother liquor from the crystallization to liquid-liquid extraction at ambient temperature using approximately one volume of isobutyraldehyde to 3 volumes of the mother liquor to extract additional hydroxy-pivaldehyde.

4,036,889

PROCESS FOR PREPARING TRIARYLPHOSPHINES

Vilas M. Chopdekar, Parlin, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Aug. 27, 1975, Ser. No. 608,051

Int. Cl.[2] C07F *9/02*

U.S. Cl. 260—606.5 P 4 Claims

1. In an improved method for preparing triarylphosphines of the general formula Ar_3P, wherein Ar represents phenyl, naphthyl or anthracenyl, by dispersing molten sodium in a liquid hydrocarbon dilent, combining the resultant dispersion with a

monohalogenated aromatic hydrocarbon of the formula ArX, wherein X is chlorine, bromine or iodine, a phosphorus trihalide PX_3, an effective amount of a catalyst, and reacting the resultant mixture at a temperature between ambient and 80°C., the improvement which resides in employing as said catalyst a triarylphosphine dihalide of the formula Ar_3PX_2.

4,036,890

PREPARATION OF ORGANIC HYDROPEROXIDES

Wilhelm Ester, deceased, late of Herne, Germany; Margarete Ester, heir, Herne, Germany; Brigitte Louis nee Ester, heir, Herne, Germany; Wolfgang Ester, heir, Herne, Germany, and Wilhelm Heitmann, Herne, Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed May 11, 1965, Ser. No. 454,963

Claims priority, application Germany, May 13, 1964, 35154

Int. Cl.[2] C07C *179/02, 179/04*

U.S. Cl. 260—610 B **9 Claims**

1. In the production of organic cyclic hydroperoxides which comprises oxidizing a compound selected from the group consisting of compounds of the formula:

wherein Ar is a member selected from the group consisting of phenyl, cyclohexyl and cycloheptyl, which can be substituted by C_{1-5} alkyl and each R is an aliphatic hydrocarbon radical, and compounds of the group consisting of carane, pinane, p-menthane and camphane with an oxygen-containing gas at a temperature of about 80° to 150° C and a pressure of about atmospheric up to about 10 atmospheres; the improvement which comprises halting said oxidation when the concentration of produced hydroperoxide reaches about 1 to less than 5% by weight in the reaction mixture, and recovering said cyclic hydroperoxide.

4,036,891

PROCESS FOR PREPARING PARAFORMALDEHYDE

Jens C. T. Moller, 5245 Hayledge Court, Columbia, Md. 21045, and Ove E. Hansen, Skovgards Alle 261, 3500 Ll. Vaerlose, Denmark

Filed Dec. 29, 1975, Ser. No. 644,944

Int. Cl.[2] C07C *47/10*

U.S. Cl. 260—615.5 **8 Claims**

1. A process for the production of a powdery, free-flowing paraformaldehyde comprising:

a. forming a particulate formaldehyde product by spraying a concentrated aqueous formaldehyde solution containing from about 75% to about 90% formaldehyde by weight into a spray chamber and contacting the formaldehyde spray with an inert cooling gas flowing through said chamber,

b. removing said particulate product from said spray chamber, said particulate product being at a temperature of from above 40° to about 60° C. and passing said product into the first of a plurality of fluidized beds,

c. simultaneously drying, curing, and concentrating said product in said first bed by fluidizing said product with an inert gas, said gas being at a temperature below the sticking point of said product,

d. passing the concentrated product from said first bed into at least one other fluidized bed connected therewith and further increasing the concentration of paraformaldehyde in the particles of said product by fluidizing said particles with a separate stream of inert gas, said separate inert gas being at a temperature below the sticking point of the powder in said other fluidized bed and at a temperature greater than the temperature of the inert gas in said first bed, and

e. recovering a dry, free-flowing particulate paraformaldehyde from the last bed of said plurality of fluidized beds.

4,036,892

4-EXO-HYDROXY-ENDO-TRICYCLO [5.2.2.0^{2,6}]UNDEC-8-ENE

Yoshiaki Inamoto; Yoshiaki Fujikura; Hiroshi Ikeda, and Naotake Takaishi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

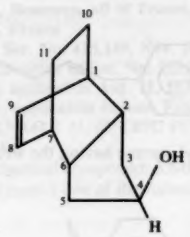
Filed May 7, 1976, Ser. No. 684,395

Claims priority, application Japan, May 26, 1975, 50-62816

Int. Cl.[2] C07C *35/22*

U.S. Cl. 260—617 F **1 Claim**

1. A compound having the formula



4,036,893

8-EXO-HYDROXY-ENDO-TRICYCLO [5.2.2.0^{2,6}]UNDECANE

Yoshiaki Inamoto; Yoshiaki Fujikura, both of Wakayama; Kiyoshi Tsuchihashi, Kainan, and Naotake Takaishi, Iwade, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

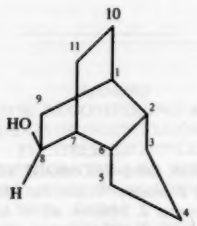
Filed May 21, 1976, Ser. No. 688,566

Claims priority, application Japan, June 20, 1975, 50-75293

Int. Cl.[2] C07C *35/22*

U.S. Cl. 260—617 F **1 Claim**

1. A compound having the formula



4,036,894

PROCESS FOR PRODUCING HALOGENATED 2,2-BIS-(4-HYDROXYPHENYL)-PROPANE

Herbert Jenkner, Cologne, Germany, assignor to Chemische Fabrik Kalk GmbH, Germany

Filed Mar. 16, 1976, Ser. No. 667,292

Claims priority, application Germany, Mar. 19, 1975, 2511981

Int. Cl.[2] C07C *39/24, 39/16*

U.S. Cl. 260—619 A **4 Claims**

1. In a process for the production of chlorinated or brominated 2,2-bis-(4-hydroxyphenyl)-propane by conversion of 2,2-bis-(4-hydroxyphenyl)-propane with elemental chlorine or bromine in individual, successive batches at a reaction temper-

ature of from room temperature up to about 90° C. and in an acetic acid reaction medium, wherein hydrogen chloride or hydrogen bromide is formed along with the chlorinated or brominated 2,2-bis-(4-hydroxyphenyl)-propane in each successive batch reaction, and wherein the acetic acid reaction medium is the mother liquor of a preceding batch reaction, the improvement which comprises:

cooling the mother liquor of a preceding batch reaction to room temperature and separating therefrom the chlorinated or brominated 2,2-bis-(4-hydroxyphenyl)-propane formed during the reaction;

adding to said mother liquor an alkaline or alkaline earth acetate in an amount of from 5 to 500% in excess of the amount necessary for the conversion of all free hydrogen halides present in said mother liquor; and

employing said mother liquor as the reaction medium in a new batch.

4,036,895

PROCESS FOR PREPARING 2-METHYLPROPANE-1,3-DIOL

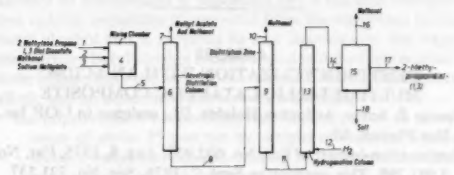
Axel Vogel, Cologne; Wolfgang Biedermann, Krefeld-Bockum; Kurt Halcour; Norbert Schenk, both of Leverkusen, and Wulf Schwerdtel, Leverkusen-Steinbuechel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 18, 1974, Ser. No. 507,173

Claims priority, application Germany, Sept. 26, 1973, 2348353

Int. Cl.² C07C *29/00*

U.S. Cl. 260—635 R **9 Claims**



1. A process for preparing 2-methylpropane-1,3-diol which comprises the steps of

a. reacting 2-methylenepropane-1,3-diol diacetate at a temperature of 0° to 200° C with a monohydric C_1–C_4 aliphatic alcohol in excess of from 0.1 to 40 mols per mol of 2-methylenepropane-1,3-diol diacetate over the stoichiometric amount of said alcohol in the presence of a base selected from the group consisting of an alkali C_1–C_4 alcoholate, an alkali metal hydroxide, an alkali metal carbonate and a basic ion exchanger;

b. adjusting thereafter the concentration of said alcohol, either by adding more alcohol or by distilling off excess alcohol, so that the reaction mixture contains from 0.1 to 30 mols of alcohol for each mol of 2-methylenepropane-1,3-diol diacetate initially reacted;

c. and without isolating the resultant 2-methylenepropane-1,3-diol from step (a), thereafter catalytically hydrogenating it to form 2-methanepropane-1,3-diol employing a catalyst which hydrogenation component comprises Raney nickel, Raney nickel-iron, finely divided nickel on a carrier or a noble metal at a temperature of −20° to 180° C.

4,036,896

PRODUCTION OF CHLORO-SUBSTITUTED SATURATED COMPOUNDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,988

Int. Cl.² C07C *17/00*

U.S. Cl. 260—648 R **14 Claims**

1. A process for producing a chloro-substituted saturated compound which comprises condensing a saturated hydrocarbon containing at least 3 carbon atoms and a hydrogen atom attached to a secondary or tertiary carbon atom or to a saturated side chain carbon atom which is attached to an aromatic ring hydrocarbon with a chloromonoolefin in which a chlorine atom is attached to a carbon atom other than one of the doubly-bonded carbon atoms in the presence of a free radical-generating catalyst at reaction conditions, and recovering the resultant chloro-substituted saturated compound.

4,036,897

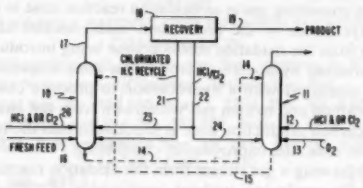
PRODUCTION OF HEXACHLOROCYCLOPENTADIENE

Vincent A. Strangio, Glenridge; Herbert Riegel, Maplewood, and Morgan C. Sze, Upper Montclair, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Aug. 4, 1976, Ser. No. 711,632

Int. Cl.² C07C *23/08*

U.S. Cl. 260—648 C **33 Claims**



1. A process for producing hexachlorocyclopentadiene, comprising:

contacting in a hexachlorocyclopentadiene production zone a feed selected from the group consisting of saturated C_5 hydrocarbons, mono-olefinically unsaturated C_5 hydrocarbons and chloro substituted derivatives of such saturated and mono-olefinically unsaturated C_5 hydrocarbons, with a molten salt mixture of cuprous and cupric chloride to produce an effluent containing hexachlorocyclopentadiene.

4,036,898

NOVEL CHLORINATED DICUMENE INITIATORS

Hendrik H. J. Oosterwijk, Diepenveen; Eduard P. Magré, Wiersum, and Wilhelmus M. Beyleveld, Olst, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

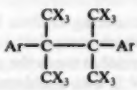
Filed Oct. 14, 1975, Ser. No. 621,985

Claims priority, application Netherlands, Oct. 14, 1974, 7413633

Int. Cl.² C07C *25/22*

U.S. Cl. 260—649 R **1 Claim**

1. An aliphatically chlorinated cumene dimer corresponding to the formula:



wherein Ar is an aryl group and X is hydrogen or chlorine and provided that at least 1 but not more than 5 X groups are chlorine.

4,036,899

SYNTHESIS OF PRENYL CHLORIDE

Joseph Levy, Northbrook, and Nils J. Christensen, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 20, 1976, Ser. No. 650,813
Int. Cl.[2] C07C *21/00*
U.S. Cl. 260—654 R 9 Claims

1. A process for the preparation of prenyl chloride which comprises reacting isoprene with aqueous hydrochloric acid in the presence of an alkali metal chloride at reaction conditions, and recovering the resultant prenyl choride.

4,036,900

MOLTEN SALT LIFT GAS SYSTEM FOR PRODUCTION OF CHLORINATED HYDROCARBONS

Vincent A. Strangio, Glenridge, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Sept. 3, 1975, Ser. No. 610,061
Int. Cl.[2] C07C *17/10, 17/15*
U.S. Cl. 260—659 R 6 Claims

1. In a process for producing a chlorinated hydrocarbon wherein a molten salt containing a multivalent metal chloride in its higher and lower valence state is contacted with an oxygen containing gas in an oxidation reaction zone to produce the oxychloride of the multivalent metal, molten salt withdrawn from the oxidation reaction zone being introduced into a chlorinated hydrocarbon production zone wherein molten salt is contacted with a hydrocarbon to produce chlorinated hydrocarbon and molten salt withdrawn from the chlorinated hydrocarbon production zone is introduced into the oxidation reaction zone, the improvement comprising:

withdrawing a gas stream from the oxidation reaction zone;

directly employing, without compression, a portion of the gas stream withdrawn from the oxidation reaction zone at an initial pressure corresponding to the pressure prevailing in the oxidation reaction zone to lift molten salt withdrawn from the chlorinated hydrocarbon production zone to an elevated height for introduction into an upper portion of the oxidation reaction zone by expansion of said portion of the gas stream from said initial pressure to an expanded pressure to provide a ratio of said initial pressure to said expanded pressure of said portion of the gas stream of at least 1.5; and

employing, without compression, another portion of the gas stream withdrawn from the oxidation reaction zone at an initial pressure corresponding to the pressure prevailing in the oxidation reaction zone for lifting molten salt withdrawn from the oxidation reaction zone to an elevated height for introduction into an upper portion of the chlorinated hydrocarbon production zone by expansion of said another portion of the gas stream from said initial pressure to an expanded pressure to provide an initial pressure toexpanded pressure ratio of at least 1.5.

4,036,901

PROCESS FOR PRODUCING STYRENE

Masato Kawakami, Yokohama; Naoki Andoh, Yokkaichi; Akira Iio, Yokkaichi, and Haruo Yamanouchi, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,380
Claims priority, application Japan, Oct. 28, 1974, 49-123442
Int. Cl.[2] C07C *15/00, 15/10*
U.S. Cl. 260—669 R 18 Claims

1. A process for producing styrene by the oxidation of a 4-vinylcyclohexene, which comprises:

contacting 4-vinylcyclohexene in the gas phase at a temperature of 250° – 600° C with a molecular oxygen-containing gas at a contact time of 0.1–10 seconds in the presence of a catalyst composition consisting essentially of:

$Mo_{12}Bi_{0.1-10}Fe_{0-15}Pb_{0-15}X_{0-10}Y_{0-5}O_n$

wherein X is at least one element selected from the group consisting of zirconium, cadmium, niobium and antimony; Y is at least one element selected from the group consisting of lithium, sodium, potassium, rubidium, cesium and thallium; and *n* is the number of oxygen atoms sufficient to satisfy the valence requirements of the metallic elements, with the proviso that the sum of the atomic proportions of Fe, Co and/or Pb must range from 1 – 25.

4,036,902

CHEMICAL PROCESS PRODUCING AROMATIC HYDROCARBONS BY DEHYDROCYCLODIMERIZATION OF A C_4 FEEDSTOCK

Reginald Gregory, Camberley, England, assignor to The British Petroleum Company Limited, London, England

Filed June 16, 1976, Ser. No. 696,573
Claims priority, application United Kingdom, June 23, 1975, 26528/75
Int. Cl.[2] C07C *3/04*
U.S. Cl. 260—673 8 Claims

1. A process for producing aromatic hydrocarbons comprising subjecting a C_4 feedstock to dehydrocyclodimerisation at a temperature between about 450° to 700° C in the presence of a catalyst comprising an alumina promoted by zinc or a compound of zinc.

4,036,903

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 602,935, Aug. 8, 1975, Pat. No. 3,981,795. This application Sept. 7, 1976, Ser. No. 721,137
Int. Cl.[2] C07C *3/04;* C10G *27/08;* B01J *23/82*
U.S. Cl. 260—673.5 29 Claims

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % bismuth and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,036,904

ISOMERIZATION OF ALLENES IN A HYDROCARBON STREAM USING MAGNESIUM OXIDE CATALYST

Daniel J. Strope, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

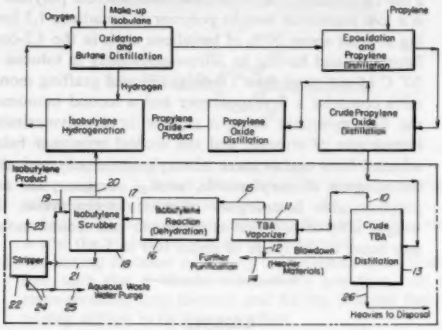
Filed June 21, 1976, Ser. No. 698,250
Int. Cl.[2] C07C *7/00, 11/12, 11/14*
U.S. Cl. 260—681.5 R 8 Claims

1. A process for reducing the amount of allenic impurities in a C-4 stream comprising 1,3-butadiene and at least one allenic impurity which consists of contacting said stream with a catalyst consisting of magnesium oxide at a temperature in the approximate range of 85° to 355° C.

4,036,905
PROCESS FOR THE MANUFACTURE OF PROPYLENE OXIDE

Alan D. Kornfeld, East Windsor, N.J., assignor to Oxirane Corporation, Princeton, N.J.

Filed Apr. 12, 1976, Ser. No. 675,864
Int. Cl.[2] C07C 1/24
U.S. Cl. 260—682 19 Claims



1. In a process for the production of isobutylene from tertiary butyl alcohol wherein a mixture containing tertiary butyl alcohol is fractionated in a fractionator, the tertiary butyl alcohol so fractionated is vaporized and a fraction containing less volatile impurities is separated from the vaporized tertiary butyl alcohol and is recycled to said fractionator, the vaporized tertiary butyl alcohol is dehydrated in dehydration zone to form isobutylene, the isobutylene is contacted with an aqueous alkali, and an aqueous waste stream is formed,

the improvement which comprises vaporizing up to a maximum of about 85 percent by weight of said fractionated tertiary butyl alcohol and passing said vaporized tertiary butyl alcohol to said dehydration zone.

4,036,906
CURED POLYURETHANE COMPOSITIONS CONTAINING EPOXY RESINS

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 390,831, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 207,976, Nov. 24, 1971, abandoned, which is a continuation of Ser. No. 889,300, Dec. 30, 1969, abandoned. This application Mar. 24, 1975, Ser. No. 561,122
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—830 P 3 Claims

1. A cured polyurethane composition characterized by its tensile strength at 25° C. Being resistant to hydrolysis degradation when immersed in distilled water at 158° F. for 14 days prepared by the method which consists of reacting a polyurethane reaction mixture, containing sufficient diamine curative therefor, in the presence of an excess of an epoxy resin, said method consisting essentially of (A) mixing in a solvent, in order to provide a fluid mixture or solution containing about 40 to about 95 percent solids, selected from benzene, xylene, toluene, acetone, methyl ethyl ketone, methyl isobutyl ketone and diisobutyl ketone (1) an epoxy resin derived from epichlorohydrin and a bis phenol and having an epoxide equivalent in the range of about 150 to about 525, (2) a prepolymer of at least one organic diisocyanate and at least one reactive hydrogen-containing polymeric material havng a molecular weight in the range of from about 700 to about 5,000 selected from polyester polyols, polyether polyols and hydroxyl terminated unsaturated polymeric polyols with a hydroxyl functionality of about 2 to about 3 where the ratio of the diisocyanate of the reactive hydrogens of the reactive hydrogen-containing polymeric material is from about 1.1/1 to about 3.5/1, and (3) a primary diamine curative where the ratio of amino groups of the curative to isocyanato groups in excess of the reactive hydrogens of the reactive hydrogen-containing polymeric material is from about 0.5/1 to about 1.1/1 and where the said polyurethane composition contains from about 2 to about 15 weight percent and at least a sufficient amount to give about a 5 to about a 50 equivalent percent excess of epoxide groups relative to the total excess of said amino groups of the curative over the said isocyanato groups, wherein said epoxy resin in contacted with said primary diamine only at or just prior to preparing said reaction mixture, and (B) substantially simultaneously removing the solvent from the mixture and reacting the prepolymer with the diamine curative in the presence of the epoxy resin at a temperature in the range of about 20° C. to about 100° C.

4,036,907
POLY(META-PHENYLENE ISOPHTHALAMIDE) COMPOSITION

John William Turnbull, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company., Wilmington, Del.

Division of Ser. No. 466,016, May 1, 1974, Pat. No. 3,954,703, which is a division of Ser. No. 262,599, June 14, 1972, Pat. No. 3,925,323. This application Nov. 10, 1975, Ser. No. 630,409
Int. Cl.[2] C08L 77/00
U.S. Cl. 260—857 L 3 Claims

1. A composition consisting essentially of a coalescible and densifiable powder of poly(meta-phenylene isophthalamide) having a density of between about 1.0 g./cc. and about 1.30 g./cc. when pressed into a preform and a density when sintered of at least about 1.24 g./cc. and between about 1% and about 75% by weight, based upon the total weight of said composition, of particulate halocarbon resin.

4,036,908
PREPARATION OF VARNISHES BASED ON POLYESTER RESIN

Gilbert Chretien, Chauny; Gerard Ditacroute, Autreville, and Jacques Meyer, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 19, 1976, Ser. No. 668,722
Claims priority, application France, Apr. 10, 1975, 75.11199
Int. Cl.[2] C08L 67/06
U.S. Cl. 260—863 11 Claims

1. A process for the preparation of a polyester resin varnish comprising subjecting one or more polycarboxylic acids, at least one of which is an ethylenically unsaturated carboxylic acid, and one or more polyols, at least one of which is a diol, to polycondensation reaction, dissolving the polycondensation reaction product in a copolymerizable vinyl monomer, stabilizing the solution by the addition of an inhibitor with the copolymerizable monomer or after addition of monomer to the solution, adding a cobalt compound to the stabilized solution as an accelerator for cross-linking, and introducing a magnesium compound before 75% completion of the polycondensation reaction whereby reducing groups are formed in the polycondensate which avoid a green discoloration by reason of the presence of the cobalt compound.

4,036,909

PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF VINYL AND DIENE COMPOUNDS

Frantisek Hrabak; Vlasta Hynkova, and Milan Bezdek, all o. Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 389,533, Aug. 20, 1973, Pat. No. 3,998,910, which is a continuation-in-part of Ser. No. 143,225, May 13, 1971, abandoned. This application Sept. 2, 1975, Ser. No. 609,182

Claims priority, application Czechoslovakia, May 14, 1970, 3332/70

Int. Cl.² C08L *25/06*

U.S. Cl. 260—874 **13 Claims**

1. A process for polymerization or copolymerization of monomeric olefinic conjugated or unconjugated unsaturated organic compound or their combinations comprising the step of providing a mixture consisting of monomeric olefinic unsaturated organic compound and an initiator system comprising (a) an organic peroxide and (b) a polymeric or copolymeric tertiary amine selected from the group consisting of poly(p-dimethylaminostyrene), copolymers of styrene and p-dimethylaminostyrene, poly (N,N-dimethylaminostyrene) and copolymers of styrene and N,N-dimethylaminostyrene, and polymerizing said mixture at a temperature of from about 20° to about 30° C. until completion of the polymerization, said initiator system comprising from 0.01 to 5% by weight based on said organic compound of an organic peroxide selected from the group consisting of diacylperoxides, diarylperoxides and dialkylperoxides and such an amount of amine that the molar ratio between peroxide amine groups is within the range from 10:1 to 1:10.

4,036,910

BLOCK COPOLYMERS AS VISCOSITY INDEX IMPROVERS FOR LUBRICATION OILS

William S. Anderson, Oakland, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 884,721, Dec. 12, 1969, Pat. No. 3,763,044. This application Mar. 14, 1973, Ser. No. 342,896

Int. Cl.² C08F *293/00*

U.S. Cl. 260—879 **2 Claims**

1. As a new composition of matter, a block copolymer having the configuration

polystyrene-hydrogenated polyisoprene

wherein the polystyrene block has an average molecular weight between about 5,000 and 50,000 and the hydrogenated polyisoprene block has an average molecular weight between about 10,000 and 1,000,000, at least 50% of the double bonds of the polyisoprene block being reduced by hydrogenation.

4,036,911

PREPARATION OF GRAFT COPOLYMERS

Brian Howard Alfred Smith, Sarnia, Canada, assignor to Polymer Corporation Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 88,517, Nov. 10, 1970, abandoned. This application July 17, 1972, Ser. No. 272,150

Claims priority, application Canada, Dec. 24, 1969, 070816

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 R **10 Claims**

1. A process for preparing an impact-resistant thermoplastic resin which comprises:

a. dissolving 5–30 parts by weight of a mixture of preformed rubbery polymer A and preformed polymer B in 70–95 parts by weight of a mixture of grafting monomers, the weight ratio of polymer A to polymer B being greater than 1:1,

b. prepolymerizing with agitation the mixture so formed to a conversion of grafting monomers of from about 10% to about 40% whereby a dispersion is formed of a solution of said preformed polymers in a solution of a polymer of said grafting monomers,

c. continuing the polymerization of the residual grafting monomers to at least 50% conversion, said continued polymerization being carried out in bulk or in aqueous suspension, and

d. recovering the thermoplastic resin so formed, wherein polymer A is an 85+% 1,4-content polybutadiene having a cis-1,4 content of at least 35%, and wherein polymer B is a low molecular weight polymer of butadiene-1,3 having at least about 50% of butadiene units in the 1,2-configuration and having an intrinsic viscosity in toluene at 30° C of not more than 1.0 dl/g, and said grafting monomers comprise a first monomer and a second monomer, the first monomer being a styrene or a polymerizable homologue of styrene, and the second monomer being selected from one or more of acrylonitrile polymerizable homologues of acrylonitrile, methyl methacrylate and polymerizable homologues of methylmethacrylate, the weight ratio of said first monomer to said second monomer being in the range of about 10:1 to 1:2.

4,036,912

THERMOPLASTIC POLYMER BLENDS OF EP OR EPDM POLYMER WITH CRYSTALLINE POLYPROPYLENE

Paul Thomas Stricharczuk, Solon, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 6, 1975, Ser. No. 619,806

Int. Cl.² C08L *23/00*

U.S. Cl. 260—897 A **7 Claims**

1. A thermoplastic polymer blend comprising (1) a polymer consisting essentially of interpolymerized units of about 65 percent to about 85 percent by weight of ethylene, about 5 percent to about 35 percent by weight of propylene, and up to about 10 percent by weight of a diene monomer; said polymer having an ethylene sequence index of from about 30/1 to about 70/1 and a melt endotherm value of about 2 to about 15 calories per gram and (2) from about 5 parts to about 200 parts by weight per 100 parts by weight of the EPDM polymer, of a crystalline polypropylene polymer.

4,036,913

PHOSPHORUS COMPOUNDS

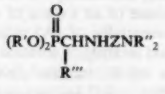
Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 385,779, Aug. 6, 1973, Pat. No. 3,954,860. This application July 14, 1975, Ser. No. 595,959

Int. Cl.² C07F *9/32, 9/40, 9/53*

U.S. Cl. 260—938 **7 Claims**

1.



where

R′ is aryl of 6 to 10 carbon atoms,

R″ is hydrogen, alkyl, aryl or haloaryl of 1 to 15 carbon atoms, or no more than one carboalkyloxymethyl group, and where the halogen on the aryl group is bromine, chlorine or fluorine,

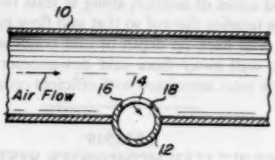
R‴ is alkyl, alkenyl or aryl of 1 to 15carbon atoms and substituted aryl forms where the substituent is fluorine, chlorine, bromine, nitro, cyano, hydroxyl, alkyloxy or mixtures of such substituents and Z is CO or CS.

4,036,914

LIQUID FUEL MIXING DEVICE

John Hawryluk, 601 Middlesex Drive, Cinnaminson, N.J. 08077

Filed Aug. 14, 1975, Ser. No. 604,712
Int. Cl.[2] F02M 29/06
U.S. Cl. 261—79 R 5 Claims



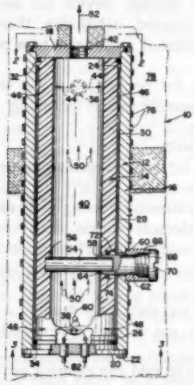
1. A fuel-air mixing device, comprising:
a. an elongated conduit through which air is passed and which has a horizontal section,
b. a hollow fuel-air mixing chamber disposed transversely across the horizontal section of the conduit,
c. the mixing chamber extending only slightly into the conduit such that it blocks substantially less than half the cross-sectional area thereof, and having a liquid fuel retaining section in its lower portion,
d. the surface of the mixing chamber in the conduit having a relatively wide central opening disposed transversely to the conduit and through which a portion of the air stream in the conduit passes,
e. the inner wall of the mixing chamber having a generally circular configuration which imparts a circular swirling motion to the air stream passing through the central opening so that it contacts the surface of the fuel in the liquid fuel retaining section.

4,036,915

TEMPERATURE-CONTROLLED APPARATUS FOR FLUID PERMEATION OR THE LIKE

Daniel P. Lucero, Triangle, and Alan R. Teets, Springfield, both of Va., assignors to Meloy Laboratories, Inc., Springfield, Va.

Division of Ser. No. 320,624, Jan. 2, 1973, Pat. No. 3,904,849.
This application Jan. 3, 1974, Ser. No. 430,572
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—104 7 Claims



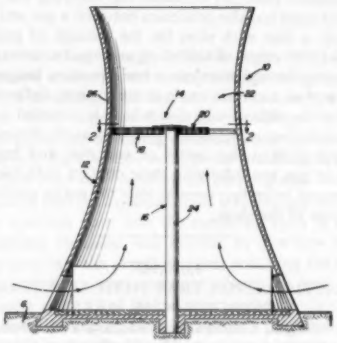
1. Permeation apparatus comprising a cylindrical housing with a metal cylindrical side wall, a hollow cylindrical core with a cylindrical side wall coaxially within said housing, the outer surface of the cylindrical side wall of said core and the inner surface of the cylindrical side wall of said housing delimiting therebetween a thin flow passage for conducting carrier gas between opposite ends of said core over the periphery of said core, the thickness of said flow passage being small compared with the thickness of said housing side wall and said passage having a high ratio of length to thickness, means for admitting carrier gas to one end of said flow passage, means coupling the other end of said flow passage to one end of the interior of said core, closures for said housing at opposite ends thereof, said flow passage being isolated from the interior of the core at said one end of said passage, whereby the carrier gas is constrained to flow along the length of said passage and then to enter the interior of the core at said one end thereof, means for providing an outlet from said core at the opposite end thereof, means for supporting in the interior of said core a permeation fluid container having a wall permeable to fluid in the container, heater means comprising an electrical heater mounted exteriorly of the housing side wall for supplying heat to the exterior of said housing, means including a temperature sensor sensing the temperature of the carrier gas which enters the interior of the core for controlling said heater means to control the temperature in said housing, and insulation means for isolating the exterior of said housing from the ambient.

4,036,916

WIND DRIVEN ELECTRIC POWER GENERATOR

Carl F. Agsten, 1539 Bedford Road, Charleston, W. Va. 25314

Filed June 5, 1975, Ser. No. 584,193
Int. Cl.[2] B01F 3/04; F03D 7/02
U.S. Cl. 261—109 7 Claims



1. In combination with a cooling tower holding a liquid to be cooled and having a hyperbolic veil forming a throat area and a path for fluid flow through the veil, a wind driven electric power generator, comprising, in combination:
a. a support disposed within the veil; and
b. wind generator means mounted on the support within the veil for being actuated by the fluid flow through the veil and generating power, the veil being arranged extending vertically, and the support being a vertically extending, stationary, longitudinal shaft disposed substantially centrally within the veil and extending along the longitudinal extent of the veil, the veil having an inner wall surface, and the wind generator means including a rotor comprising, in combination:
1. a rotor hub rotatably mounted on the shaft in the throat of the veil for rotation about an axis of rotation; and
2. a rotor arm connected to the rotor hub and extending radially from the rotor hub to supportive engagement with the inner wall surface of the veil and forming means for being rotated about the shaft by the fluid flow through the veil, the flow being parallel to the axis of rotation of the rotor hub, wherein the inner wall surface of the veil is provided at the throat of the veil with a circular track defining a center through which passes an axis formed by the longitudinal extent of the shaft, and the circular track being disposed opposite the rotor hub of the rotor, and a trolley mounted on the rotor arm at an end thereof spaced

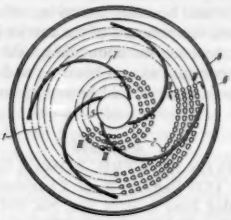
from the rotor hub, the trolley being arranged engaging the track for supporting the rotor arm during rotation of the rotor.

4,036,917

CONTACT PLATE FOR COLUMNS FOR CARRYING OUT MASS TRANSFER PROCESSES BETWEEN GAS AND LIQUID

Ivan Petrovich Slobodyanik, ulitsa Gagarina, 87, kv. 15, Krasnodar, U.S.S.R.

Filed Dec. 4, 1975, Ser. No. 637,828
Int. Cl.[2] B01D *3/22, 3/26*
U.S. Cl. 261—114 JP **5 Claims**



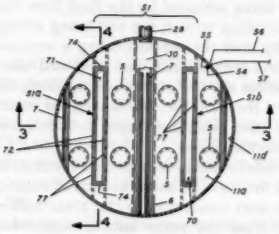
1. A contact plate for columns for carrying out heat exchange and mass transfer processes between a gas and a liquid, comprising: a disc with slots for the passage of gas; arched deflectors at the edges of said slots, arranged so as to send jets of gas passing through the slots in one direction, tangentially to said disc and at a certain angle to its surface; deflector strips attached to the side of said disc which is intended to receive liquid, said deflector strips being shaped as Archimedean spirals diverging from the center of said disc and bent in the direction of gas jets following their contact with said arched deflectors and extending over at least the major portion of the radial extent of the slots.

4,036,918

FRACTIONATION TRAY WITH ADJUSTABLE CAPACITY WEIR MEANS

Barry S. Morgan, Concord, and Richard P. Sandell, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 449,150, March 7, 1974, Pat. No. 3,985,623.
This application Mar. 29, 1976, Ser. No. 671,479
Int. Cl.[2] B01D *47/00;* **C10J** *1/08;* **F02M** *29/04*
U.S. Cl. 261—114 R **3 Claims**



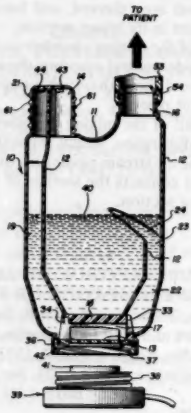
1. An article of manufacture to increase condensate flow interior of a fractionation column at a withdrawal tray adjacent to a fractionating tray connected thereto via a downcomer means having a four-sided, raised lip, rectangularly shaped in cross section, extending above said withdrawal tray defining a vertical opening therethrough comprising, in combination, a four-sided upright barrier wall rectangularly shaped in cross section to match that of said raised lip of said downcomer means, said upright barrier wall further comprising means cooperating to connect and means cooperating to extend it upwardly from said raised lip of said downcomer means and including a series of notches along its top extremity away from said downcomer means, such that condensate flow between said withdrawal and said fractionating trays of said column is directable from locations exterior of said barrier wall through said series of notches along at least two sides thereof to a position interior thereof so that said flow can be measured as a function of back-up depth of said condensate exterior of said barrier wall away from said downcomer means over a range of flow rates associated with efficient column operations.

4,036,919

NEBULIZER-HUMIDIFIER SYSTEM

Henry Komendowski, Evanston, and Walter Levine, Lincolnwood, both of Ill., assignors to Inhalation Therapy Equipment, Inc., Chicago, Ill.

Continuation of Ser. No. 483,227, June 26, 1974, abandoned.
This application Dec. 17, 1975, Ser. No. 641,626
Int. Cl.[2] A61M *15/00*
U.S. Cl. 261—122 **12 Claims**



1. An inhalation therapy device for use either in a first, humidifying, or a second, nebulizing, therapeutic mode for delivery of a moisturized gas stream to a patient, said device comprising:

container means for containing a gas stream-moisturizing liquid, said container means including

1. a top element,
2. a bottom element,
3. a continuous sidewall element interconnecting said top and bottom elements,
4. perforated gas stream-diffusing plate means spaced above said bottom element within said container means and defining with said bottom element and said sidewall element a gas stream diffusion chamber within said container means,
5. means in said top element providing a delivery outlet for a moisturized gas stream from within said container means, and
6. passage means in said top element providing
   a. an outlet for exhausting a gas stream from said container means upon blockage of said delivery outlet means when the device is employed in said first therapeutic mode and
   b. an inlet for entry of a moisturized gas stream into said container means when the device is employed in said second therapeutic mode; and

conduit means for fluid flow, communicating between said

diffusion chamber and a point at said top of said container means adjacent said passage means, and providing

a. a gas stream conduit when the device is employed in said first therapeutic mode and

b. a liquid conduit when the device is employed in said second therapeutic mode.

4,036,920

PROCESS FOR THE PREPARATION OF FUEL KERNELS

Oizumi Chihiro, Hachioji, and Uesugi Juno, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 6, 1976, Ser. No. 683,999
Int. Cl.[2] G21C *21/00*
U.S. Cl. 264—.5 13 Claims

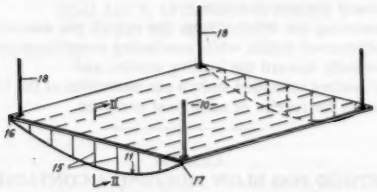
1. A process for the preparation of fuel kernels for coated particle fuels for use in a high-temperature gas-cooled reactor comprising adding β-1,4-glucan powder to at least one compound selected from the group consisting of a thorium compound, an uranium compound and a plutonium compound, granulating the resulting blend in the presence of a dispersion medium to produce small spheres and subjecting the small spheres to drying and heating for firing.

4,036,921

METHOD OF MAKING A CURVED ROOF

Peter Edington Ellen, 16 Cornwall Avenue, Turramurra, New South Wales, Australia

Filed Sept. 8, 1975, Ser. No. 611,510
Int. Cl.[2] E04B *1/16, 1/132;* E04G *21/00*
U.S. Cl. 264—32 8 Claims



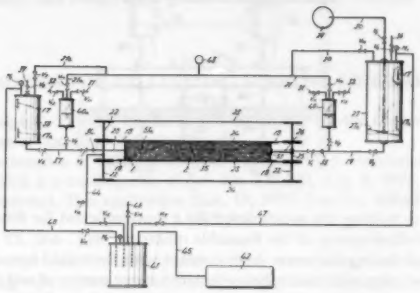
1. A method of constructing a curved roof structure from a reinforced concrete slab comprising arranging reinforcement elements for a concrete slab in a substantially flat plane, supporting at spaced points a plurality of tension cables extending in at least one direction across the reinforcing elements curving at least a portion of each cable in a substantially parabolic shape, attaching struts of predetermined lengths to spaced points along the tension cables and to the reinforcing elements in accordance with the substantially parabolic shape of the cables, casting a flat concrete slab about the reinforcing elements and thereafter uniformly tensioning the cables thereby reducing curvature thereof and curving the concrete slab to form a curved roof structure capable of resisting applied loads because of its curved shape.

4,036,922

METHOD AND APPARATUS FOR MOULDING HYDRAULIC CEMENT OR THE LIKE MATERIAL

Yasuro Ito; Hideharu Kaga, both of Tokyo; Yasuhiro Yamamoto, Ageo, and Tadayuki Sumita, Tokyo, all of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 526,825
Claims priority, application Japan, Nov. 24, 1973, 48-131189; Mar. 14, 1974, 49-28598; Mar. 20, 1974, 49-30888; July 23, 1974, 49-83787; July 25, 1974, 49-84673; Oct. 9, 1974, 49-115596
Int. Cl.[2] E04B *1/16*
U.S. Cl. 264—35 38 Claims



1. A method of moulding a hydraulic substance comprising aggregate and a cement and water mixture, utilizing an injection zone, a moulding zone and an overflow zone, said overflow zone being separate from the moulding zone, which comprises filling the moulding zone with aggregate, reducing the pressure in the injection zone, in the moulding zone and in the overflow zone to a vacuum, introducing said cement and water mixture into the injection zone, transferring said mixture from the injection zone into the moulding zone in sufficient excess quantity to cause said mixture to overflow from the moulding zone into the overflow zone, returning the overflow zone to at least atmospheric pressure whereby at least a portion of said excess quantity of said mixture in the overflow zone is returned to the moulding zone to eliminate the voids between the aggregate in the moulding zone created by removing the excess water and entrained air under reduced pressure, and replacing said voids with said cement and water mixture to produce a substantially void-free product, said mixture being maintained in sufficient quantity in said overflow zone to avoid the introduction of air into the moulding zone.

4,036,923

METHOD FOR FORMING LARGE REINFORCED FOAMED PLASTIC PANELS

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 3, 1975, Ser. No. 554,681
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—45.3 5 Claims

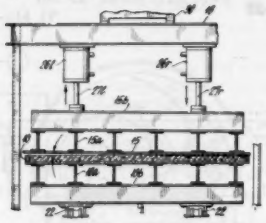
1. A method of forming a large flat foamed plastic panel from a foamable thermosetting resin reaction mixture which will foam in about 30 seconds after said mixture is formed comprising the steps of:

a. transporting an open horizontally disposed mold having a raised boundary edge defining a cavity therein beneath the discharge of a mixer while said mixer discharges the foamable mixture into the cavity of said mold within about 30 seconds, the amount of resin mixture discharged being sufficient that upon foaming the foamed resin will fill the mold;

b. continuing the transport of said mold past the discharge

end of said mixer to place said mold in position within an adjacent molding press having a mold cover therein;

c. lowering said mold cover atop said mold into contact with said raised boundary edge thereby forming a closed flat mold, said lowering being effected progressively beginning first at one corner of the end of the mold first transported into the molding press and continuing diagonally toward the opposite end thereof by a plurality of sequentially activated operators whereby trapping of air thereunder is prevented;



d. holding the mold closed for a time sufficient for foaming and setting of the foamable mixture;

e. raising the cover from contact with the raised boundary edge, said raising being initiated at one corner of said mold and contintuing diagonally to the opposite end thereof by a plurality of sequentially activated operators to progressively peel the cover from said panel whereby damage to the foamed panel is prevented; and

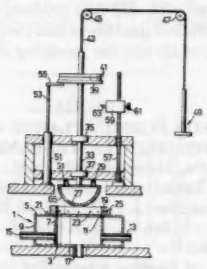
f. returning the opened mold to its initial position.

4,036,924

PROCESS AND DEVICE FOR MOLDING TEXTILE MATERIALS

Roshan Lal Shishoo, Askim, and Sara Inga-Lill Alfredsson, Kungsbacka, both of Sweden, assignors to Svenska Textilforskningsinstitutet, Goteborg, Sweden

Filed Jan. 28, 1975, Ser. No. 544,996
Claims priority, application Sweden, Feb. 14, 1974, 7401961
Int. Cl.[2] B29C *17/04*
U.S. Cl. 264—89 **21 Claims**



1. A process for molding textile fabrics comprising

a. preheating a fabric to the glass transition temperature of its component fibers;

b. subjecting the fabric to sudden deformation by stretching at the glass transition temperature, substantially the entire deformation being carried out within five seconds; and

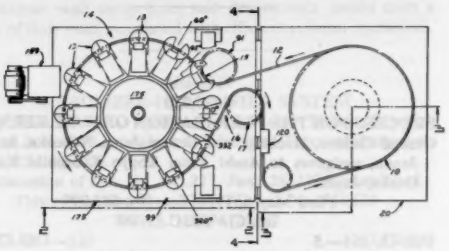
c. post-heating the fabric without intermediate cooling to a temperature at least equal to the glass transition temperature while maintaining a constant deforming load on the fabric.

4,036,925

CONTINUOUS STRETCH BLOW MOLDING METHOD

Ivan L. Kauffman, Commerce, and Robert C. Kellogg, Hartland, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 415,851, Nov. 14, 1973. This application Jan. 7, 1976, Ser. No. 647,069
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—94 **9 Claims**



1. A continuous process for forming hollow molecularly oriented articles which comprises repeatedly carrying out the steps of:

a. gravity-dropping molded preforms at molecular orientation temperature through continuously moving open-ended guide chutes onto upwardly disposed moving stretch pin assemblies continuously presented at a loading station and timed to be disposed substantially beneath an open end of a chute as the preform passes vertically downwardly therethrough such that after loading, a closed end is above an open end of each preform;

b. conveying the loaded stretch pin assemblies into operative position between separated sections of continuously and synchronously presented moving molds;

c. closing mold sections on the loaded stretch pin assemblies;

d. distending said preforms upwardly via stretch pin members and circumferentially via pressurized air after closing said sections and while the preforms are at molecular orientation temperature to form said articles;

e. separating the sections to open the continuously moving molds;

f. conveying the stretch pin assemblies with the upwardly disposed articles thereon away from the open molds toward a removal station;

g. removing the articles from the stretch pin assemblies in the removal station while continuing assembly movement generally toward the loading station; and

h. presenting unloaded stretch pin assemblies at the loading station for receipt of additional preforms.

4,036,926

METHOD FOR BLOW MOLDING A CONTAINER HAVING A CONCAVE BOTTOM

Long Fei Chang, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

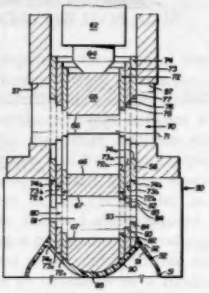
Filed June 16, 1975, Ser. No. 587,011
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—94 **1 Claim**

1. In a method of blow molding a plastic container having one concave wall from a thermoplastic material, by the inflation of a thermoplastic parison interiorly of a blow mold into a blown pre-form having the overall configuration and size of the final container with the exception of the configuration of said one wall, the one wall of the pre-form being generally convex and protruding from the remainder of the pre-form, and said one wall being at a formable temperature, the steps of, in the blow mold and while the pre-form remains inflated,

1. contacting the exterior surface of said one convex preform wall with a plurality of independently axially mov-

able, concentric sleeves surrounding a central rod which is also independently axially movable, said rod and said sleeves each having end faces provided with stepped, angularly related surfaces interrupted by radial grooves,

2. moving said rod and said sleeves with the end faces thereof in contact with said convex wall and while retaining the remainder of said pre-form stationary, the rod being moved a greater distance than any of said sleeves and the outer of said sleeves being moved a lesser distance than the inner of said sleeves,
3. the performance of step (2) deflecting the one convex wall



to a concave configuration, reducing the amount of protuberance of said one wall from the remainder of the container, and forming an annular support ring having an interior surface communicating with the interior of the container, (4) the performance of step (2) while the preform remains inflated also forcing the exterior surface of the concave wall inwardly of said support ring against the end faces of said rod and said sleeves to form on said wall annular reinforcing ribs and additional radial ribs intersecting said annular ribs, and

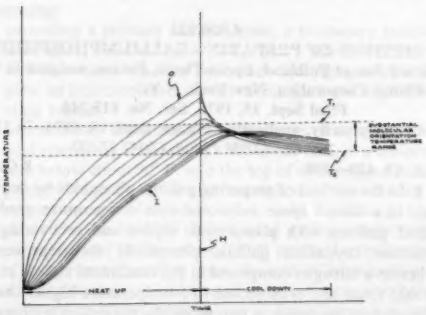
5. chilling the one wall in its deflected, concave configuration.

4,036,927

PREPARATION OF MOLECULARLY ORIENTED CONTAINERS USING REHEAT PROCESS

Thomas J. Stolki, West Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 9, 1975, Ser. No. 566,256
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—97 **15 Claims**



1. In the method of forming a molecularly oriented container from a molded preform made of an amorphous thermoplastic resin and having an open end finished neck tubular portion and a closed end body portion which method includes subjecting the preform body to a thermoforming orienting step while in a temperature range at which substantial molecular orientation occurs, the improvement which comprises heating said preform body to said substantial molecular orientation temperature range by first overheating the outside surface of said preform body, by exposing only said outside surface to external heating means, to an average outside surface temperature greater than said substantial molecular orientation temperature range thereby creating a temperature gradient across the wall thickness of said preform body and then cooling said heated preform body until the average outside surface temperature is within said substantial molecular orientation temperature range and the entire preform body is at a temperature within said substantial molecular orientation temperature range and wherein said temperature gradient is significantly reduced.

4,036,928

PROCESS FOR PELLETIZING SORPTIVE MINERAL FINES

Rudolph C. Valenta, Elmhurst, Ill., assignor to Oil-Dri Corporation of America, Chicago, Ill.

Continuation of Ser. No. 510,502, Sept. 30, 1974, abandoned, which is a continuation of Ser. No. 170,270, Aug. 9, 1971, abandoned. This application Mar. 19, 1976, Ser. No. 668,637
Int. Cl.[2] B01J *2/10*
U.S. Cl. 264—118 **11 Claims**

1. A process for making pellets from sorptive mineral fines having open pore spaces therein, which said fines include mineral particles that will pass through a 20 mesh screen, and said pellets have said open pore spaces therein and have a liquid absorption capacity substantially equal to that of the particular sorptive mineral fines used as the starting material for said pellets, said process comprising:

a. mixing said sorptive mineral fines in a mixing apparatus with water to moisten said mineral fines and to substantially fill with water said open pore spaces within the particles of said mineral fines,
b. transferring said moistened particles from said mixing apparatus to a pelletizing apparatus having a die and cutting means therewith,
c. forcing said moistened mineral particles through said die to compactly form the mineral particles into a coherent mass of material while avoiding the forcing of said water from said pore spaces,
d. cutting said coherent mass from said die to form said material into pellets,
e. transferring said pellets to a dryer, and
f. evaporating the water from said substantially filled pore spaces within said pellets to render said pore spaces open and provide said pellets with an absorption capacity in said open pore spaces approaching that capacity of said sorptive mineral fines starting material.

4,036,929

METHOD OF FORMING DECORATIVE INSERTS IN GRANITE AND THE LIKE

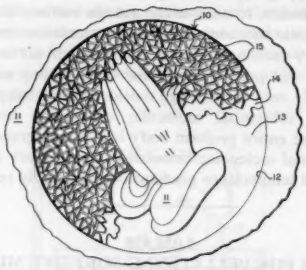
Eugene L. Gould, 309 Market St., Kittanning, Pa. 16201

Filed Feb. 13, 1976, Ser. No. 657,958
Int. Cl.[2] B29D *3/00*
U.S. Cl. 264—132 **2 Claims**

1. A method of embellishing memorial stones of granite, marble and the like with decorative inserts comprising the steps of:

a. cutting a recess into the face of a memorial stone in the approximate shape of the desired embellishment;
b. placing a moisture and temperature resistant base resin into said recess below the level of said recess and allowing said resin to set;
c. placing a mortar which is elastic over a wide temperature range into said recess over said base resin; and

d. inserting decorative chips into said mortar resin to form a desired embellishment.

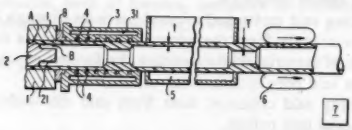


4,036,930

METHOD OF MANUFACTURING RESIN TUBES ALTERNATELY HAVING A THICK WALL PORTION AND A THIN WALL PORTION

Sadao Murai, Hitakata; Takeshi Kita, Osaka, and Kiyoshi Mochizuki, Joyo, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 24, 1975, Ser. No. 616,525
Claims priority, application Japan, Sept. 25, 1974, 49-110803
Int. Cl.[2] B29D *23/04*
U.S. Cl. 264—167 14 Claims



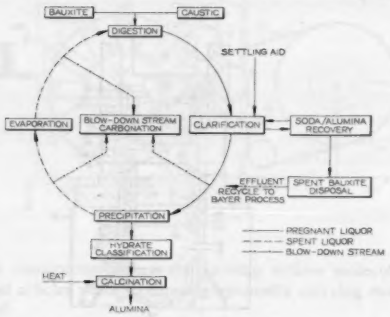
1. A method of manufacturing resin tubes alternately having a thick wall portion and a thin wall portion comprising: providing an orifice at the tip of an extruding machine of the type which extrudes resin at substantially a uniform speed; forming a tubular opening with an inner and an outer die at the extreme end of the extruding machine for forming said resin into a tube-like member, said tubular opening being divided into at least two stages along the direction of movement of said resin, one of said stages being a small-width opening portion in the inner part of said orifice and the second of said stages being a large-width opening portion at an outlet of said orifice, said large-width opening portion having an end portion open to the tip surface of said orifice; positioning control means in close contact with said tip surface of said orifice for controlling one of the outside and inside diameters of the resin tube to be extruded; and pulling a resin tube extruded at the extreme end of said means at varying speeds including at least a high speed and low speed, whereby said high and low speeds are selected so that when said resin tube is pulled at said high speed, the small-width opening portion is filled with resin but the large-width opening portion is not filled therewith, and when said resin tube is pulled at said low speed, at least the open end portion of the large-width opening portion is filled with the resin.

4,036,931

BAYER PROCESS PRODUCTION OF ALUMINA

Morris L. Roberson; John W. Beck; Jack S. Maples, all of Baton Rouge; Anthony Savariste, Plaquemine, all of La.; Donald J. Donaldson, Orinda, Calif.; David L. Stein, and Allan C. Kelly, both of Pleasanton, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed June 25, 1976, Ser. No. 699,828
Int. Cl.[2] C01F *7/06*
U.S. Cl. 423—121 10 Claims



1. In the Bayer process production of alumina from bauxite by digestion of the bauxite with a caustic solution to produce a sodium aluminate solution and a caustic-insoluble spent bauxite residue, the improvement which comprises selecting for blow-down a Bayer process stream having a pH in excess of about 12, caustic concentration expressed as Na_2CO_3, in excess of about 50 g/l and a dissolved alumina content, expressed as Al_2O_3, in excess of about 20 g/l, treating the stream with CO_2 within the temperature range of about 40°–100° C until substantially all of the dissolved alumina content of the stream is precipitated as sodium dawsonite; separating and recovering the sodium dawsonite from the carbonated blow-down stream which after removal of its sodium dawsonite content is characterized by a pH within the range of about 8.6–9 and an environmentally acceptable dissolved salt content which allows its direct disposal into naural receiving bodies.

4,036,932

METHOD OF PREPARING GALLIUMPHOSPHIDE

Gérard Joseph Poiblaud, Epron-Thaon, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,246
Claims priority, application France, Sept. 18, 1974, 74.31524
Int. Cl.[2] C09K *11/08;* C01G *15/00*
U.S. Cl. 423—299 8 Claims

1. In the method of preparing gallium phosphide by contacting, in a closed space subjected to a temperature gradient, liquid gallium with phosphorus vapors and recovering the resultant crystalline gallium phosphide, the improvement wherein a nitrogen compound in the condensed state is placed in said space and is subjected to a temperature higher than its dissociation temperature but below the maximum temperature of liquid gallium, said nitrogen compound liberating nitrogen in said temperature range thereby incorporating a slight amount of nitrogen in the crystal lattice of said gallium phosphide and preventing contamination of said gallium phosphide crystal lattice by sulfur and silicon impurities.

4,036,933
HIGHLY-ACTIVE, FINELY DIVIDED SUPER-DRY SILICON DIOXIDE

Siegmar Läufer, and Waldemar Roy, both of Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation of Ser. No. 434,577, Jan. 18, 1974, abandoned, which is a division of Ser. No. 175,382, Aug. 26, 1971, Pat. No. 3,859,420, which is a continuation of Ser. No. 886,413, Dec. 18, 1969, abandoned. This application July 10, 1975, Ser. No. 594,710

The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.

Int. Cl.[2] **C01B** *33/16, 33/18*

U.S. Cl. 423—338 **4 Claims**

1. A highly active superdry silica aerogel free of adsorbed water and hydrogen-bonded silanol groups the infrared spectrum of which is characterized by a single narrow intense band at about 3700 cm^{-1} within the range between 4000 and 2000 cm^{-1} indicating within the range between 4000 and 2000 cm^{-1} indicating the presence of free silanol groups and which spectrum is further characterized by the absence of bonds indicating the presence of adsorbed water and hydrogen-bonded silanol groups, the said silica aerogel having been produced by subjecting a pyrogenically produced silica aerogel containing adsorbed water and both free and hydrogen-bonded silanol groups to treatment in a fluidized bed at a temperature between about 700° and 1000° C and at a pressure between 2 torrs and atmospheric pressure for a period between 1 second and a few minutes through which fluidized bed a stream of dried gas that had been preheated to a temperature between 100° and 300° C was passed.

2. A highly-active super-dry silica aerogel free of adsorbed water and hydrogen-bonded silanol groups, the infrared spectrum of which is characterized by a single narrow intense band at about 3700 cm^{-1} within a range between 4000 and 2000 cm^{-1} indicating the presence of free silanol groups and which spectrum is further characterized by the absence of bonds indicating the presence of adsorbed water and hydrogen-bonded silanol groups, said silica aerogel having a surface between 100 and 400 m^2/g.

4,036,934
PREPARATION OF NITRIC ACID

Clifford E. Selin, Salt Lake City, Utah; Wayne A. Proell, Seymour, Ind., and James M. Applegate, Granger, Utah, assignors to American Hydrocarbon Company, Salt Lake City, Utah

Filed June 7, 1976, Ser. No. 693,137

Int. Cl.[2] **C01B** *21/40*

U.S. Cl. 423—394 **3 Claims**

1. A continuous process for the preparation of nitric acid comprising:

a. providing a primary reaction zone, a secondary reaction zone and a desorber zone, said primary reaction zone and said secondary reaction zone each having a stripper region, an intermediate concentration region and a gas liberating region;

b. continuously introducing a first stream of aqueous nitric acid containing from about 15 to about 35% at a temperature below about 90° F. into the top of said stripper of said primary reaction zone and continuously introducing a second stream of aqueous nitric acid containing from about 15 to about 35% nitric acid at a temperature in the range of about 150° to about 185° F. into said stripper zone of said primary reaction zone, the rate of introduction of said first stream and said second stream of nitric acid being sufficient to allow maintenance of a predetermined temperature of between about 150° to 185° F. in said gas liberating region of said primary reaction zone;

c. providing a gas seal in said gas liberating region of said primary reaction zone;

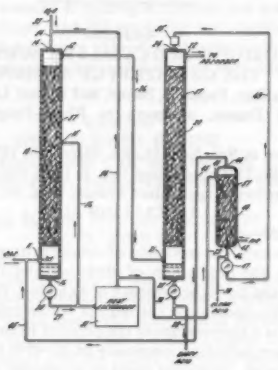
d. continuously introducing gaseous ammonia oxidation products including nitrogen oxides and a gaseous oxidizing agent including molecular oxygen into said concentration zone of said primary reactor;

e. reacting the nitrogen oxides and the oxidizing agent in the presence of said first stream in said primary reactor at a temperature below about 90° F. to produce gaseous reaction products including nitrogen dioxide and liquid reaction products including nitric acid which combine with said first stream to enrich the nitric acid content thereof and reacting the ammonia oxidation products and the oxidizing agent in the presence of said second stream in said primary reactor at a temperature of between 120° and about 185° F. to produce gaseous reaction products including nitrogen dioxide and liquid reaction products including nitric acid which combine with said seecond stream to enrich the nitric acid content thereof;

f. maintaining the temperature of said first stream as it passes through the stripper region below about 90° F. to dissolve at least a major amount of the gaseous reaction products entering the stripper region into said first stream;

g. combining said enriched first stream and said enriched second stream;

h. withdrawing said enriched first stream and said second stream of aqueous nitric acid from said reaction zone at a rate allowing maintenance of said predetermined temperature of between about 150° to 185° F. to thereby liberate nitrogen oxides dissolved in said combined streams;



i. continuously separating said combined enriched first and second stream of aqueous nitric acid into a first and a second recycle stream;

j. continuously introducing said first recycle stream into said stripper zone of said primary reaction zone to provide said second stream;

k. continuously cooling said second recycle stream to a temperature of at least about 90° F;

l. continuously separating said second recycle stream at a temperature of at least about 90° F. into a first cooled recycle stream and a second cooled recycle stream;

m. continuously introducing said first cooled recycle stream into the top of said stripper region of said primary reactor to provide said first stream;

n. continuously introducing said second cooled recycle stream into a desorbing zone spacially removed from said first primary reaction zone;

o. contacting said second cooled recycle stream in said desorber zone with a gas at a temperature of between about 70 to about 85° F. in an amount sufficient to liberate a major amount of the dissolved gaseous reaction products therein;

p. continuously introducing said liberated gaseous reaction products and said contacting gas into said primary reaction zone;

q. withdrawing a desorbed second liquid recycle stream from the liquid in the desorbing zone and separating said desorbed liquid into a product stream and a desorbed recycle stream;

r. cooling said desorbed recycle stream to a temperature of at least about 90° F.;

s. continuously introducing said cooled desorbed recycle stream into the top of said stripping region of said secondary reaction zone to provide a cooled, desorbed stripping liquid therein;

t. withdrawing the remaining gaseous reaction products from said stripper region of said primary reactor and introducing said gaseous reaction products into said concentration zone of said secondary reaction zone;

u. reacting said liberated gaseous reaction products in the presence of said stripping liquid in said secondary reaction zone to produce liquid reaction products including nitric acid which combines with said stripping liquid to enrich the nitric acid content thereof;

v. withdrawing said nitric acid enriched stripping liquid and combining said nitric acid enriched stripping liquid with said cooled second recycle stream; and

w. adding water to said stripping zone of said primary reactor, the amount and rate of water added, and product stream separated, being coordinated to provide said first stream introduced into the top of said stripper region of said primary reaction zone with a nitric acid concentration in the range of about 15 to 35% by weight.

4,036,935

COBALT OXIDE-BASED CATALYTIC SUBSTANCES FOR THE OXIDATION OF AMMONIA

Jean-Louis Ray, Fontaine, Saone, and Robert Laugier, Fresnes, both of France, assignors to Rhone-Progil, Courbevoie, France

Division of Ser. No. 451,882, March 18, 1974, Pat. No. 3,962,138. This application Feb. 9, 1976, Ser. No. 656,138

Claims priority, application France, Mar. 20, 1973, 73.09862

Int. Cl.² C01B *21/26*

U.S. Cl. 423—404 **4 Claims**

1. In the catalytic oxidation of ammonia to produce nitrogen oxides for the production of nitric acid by the oxidation of ammonia and air in the presence of a catalyst, the improvement wherein the oxidation is carried out with a catalyst formed by calcining at a temperature of the order of from 900° C to 1000° C a mixture consisting essentially of 60–95% by weight tricobalt tetraoxide, aluminum oxide in an amount greater than 5% by weight but which does not exceed 15% by weight, and an oxide of a metal selected from the group consisting of thorium, cerium, zinc and cadmium in an amount that does not exceed 25% by weight.

4,036,936

PROCESS FOR PREPARING HYDRAZINE HYDRATE

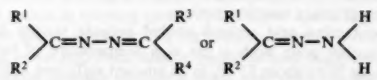
Hideo Yamaguchi; Hidetoshi Kume, both of Naruto, and Osamu Shibuta, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1975, Ser. No. 604,956

Int. Cl.² C01B *21/16*

U.S. Cl. 423—407 **14 Claims**

1. In preparing hydrazine hydrate by hydrolyzing ketazine or hydrazone represented by the formula



wherein

R^1 and R^2 are the same or different and are each alkyl having 1 to 3 carbon atoms, the total number of carbon atoms of R^1 and R^2 being 4 or less than 4, R^3 and R^4 are the same or different and are each alkyl having 1 to 3 carbon atoms, the total number of carbon atoms of R^3 and R^4 being 4 or less than 4, a process comprising the steps of:

1. removing free ketone from ketazine or hydrazone in the form of an aqueous or ketone solution by fractional distillation;
2. hydrolyzing the solution resulting from the fractional distillation by treating said solution in at least two hydrolysis reactors in series, each of the hydrolysis reactors having contact columns at the top thereof;
3. supplying the solution resulting from the hydrolysis treatment in step (2) to the upper portion of a hydrazine hydrate recovery means and recovering hydrazine hydrate from the bottom of the hydrazine hydrate recovery means and obtaining a vapor from the top of said hydrazine hydrate recovery means;
4. contacting the recovered vapor from step (3) in countercurrent manner with the solution contained in the last in the series of hydrolysis reactors and sequentially contacting the thus contacted vapor with the solutions in each of the next preceding hydrolysis reactors;
5. finally removing the vapor from the first of the hydrolysis reactors and introducing the vapor to the fractional distillation step to remove ketones from said vapor;

and wherein during the process, the amount of solution in each of the hydrolysis reactors is not less than the amount of aqueous solution of hydrazine hydrate recovered per hour from step (3) and wherein the solution in each of the hydrolysis reactors has a mole ratio between 2.0 to 1.2, said mole ratio being defined by the following formula:

$$\text{mole ratio} = \frac{\text{total ketone}}{\text{total hydrazine}}$$

$$\text{total ketone} = \left[\begin{array}{l}\text{number of moles of free ketone in equilibrium system}\end{array}\right] + \left[\begin{array}{l}\text{number of moles of ketone to be formed by complete hydrolysis of ketazine or hydrazone}\end{array}\right]$$

$$\text{total hydrazine} = \left[\begin{array}{l}\text{number of moles of free hydrazine in equilibrium system}\end{array}\right] + \left[\begin{array}{l}\text{number of moles of hydrazine to be formed by complete hydrolysis of ketazine or hydrazone}\end{array}\right].$$

4,036,937

DIAMOND SYNTHESIS

Alexander Rose Roy, 16 Cecil St., Meredale, Johannesburg, Transvaal, and Anthony Bayliss Clarke, Plot 54, "Vischkuil", P.O. Endicot, Transvaal, both of South Africa

Filed Sept. 13, 1974, Ser. No. 505,982

Claims priority, application South Africa, Sept. 14, 1973, 73/7322

Int. Cl.² C01B *33/06*

U.S. Cl. 423—446 **11 Claims**

1. In a method of making RD diamond particles wherein a solvent metal is placed in contact with a carbonaceous material in a reaction zone and the contents of the reaction zone are subjected to elevated conditions of temperature and pressure to convert the carbonaceous material into diamond, the elevated conditions of temperature and pressure being maintained for a period suitable for RD diamond growth, the improvement comprising:

providing the carbonaceous material in the form of a sleeve around a core of the solvent metal, the ratio of the width of the sleeve to the diameter of the core being in the range 1:20 to 1:5, whereby zones of weakness are produced in the

sleeve and the solvent metal penetrates the zones of weakness when the contents of the reaction zone are subjected to

the elevated conditions of temperature and pressure and elongate RD diamond particles are produced.

4,036,938

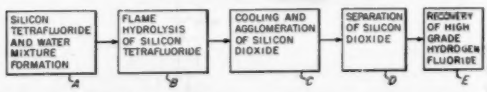
PRODUCTION OF HIGH PURITY HYDROGEN FLUORIDE FROM SILICON TETRAFLUORIDE

Richard S. Reed, 715 White Bridge Road, Millington, N.J. 07946

Continuation-in-part of Ser. No. 608,652, Aug. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 290,121, Sept. 16, 1972, abandoned. This application Oct. 7, 1976, Ser. No. 730,654

Int. Cl.² C01B 7/22, 33/12

U.S. Cl. 423—483 **13 Claims**



1. The method of producing commercial grade hydrogen fluoride comprising the steps of

a. forming a mixture of silicon tetrafluoride and water vapor;

b. flame hydrolysing the silicon tetrafluoride at a temperature in the range from about 2100° F to above about 3000° F with a ratio of available water to stochiometric water for flame hydrolysis in the range from above about 1:1 to about 14:1 to convert at least 95% of the silicon tetrafluoride to hydrogen fluoride and silicon dioxide particles with diameters in excess of about 100 millimicrons;

c. cooling the reaction products of the flame hydrolysis by more than 500° F with negligible dilution;

d. agglomerating the silicon dioxide particles and removing them from the reaction products; and

e. recovering hydrogen fluoride with a purity in excess of 95%.

4,036,939

METHOD FOR RECOVERY OF HYDROGEN CHLORIDE FROM DILUTE SOLUTIONS

Jacques Duhayon, Clamart; Michel Jean Jacques, Paris; Pierre Michel, Courbevoie; Maurice Tarnero, Fontenay-aux-Roses, and Edmond Zellner, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 24, 1974, Ser. No. 463,715

Claims priority, application France, Apr. 24, 1973, 73.14809

Int. Cl.² C01B 7/08

U.S. Cl. 423—488 **11 Claims**

1. A method for recovery of hydrogen chloride contained in an aqueous solution of hydrochloric acid comprising the following steps:

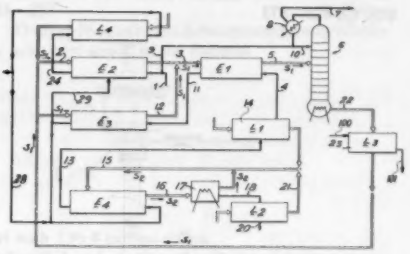
1. extracting hydrogen chloride and water contained in an aqueous solution of hydrochloric acid by counter current circulation contact of said solution with an organic solvent to load said solvent with hydrogen chloride and water,

2. dehydrating said solvent containing said hydrogen chloride and water by circulation in exchange relationship with an aqueous solution concentrated in dehydrating inorganic chloride salt,

3. distilling off hydrogen chloride from said solvent after said dehydration to recover by distillation gaseous hydrogen chloride and leave impure solvent.

4. recovering the impure solvent after distilling off said hydrogen chloride, and

5. to recover hydrogen chloride transferred to said aqueous



solution of chloride salt, (a) circulating said aqueous solution of chloride salt from step (2) in exchange relationship with another solvent of the same chemical composition as said organic solvent of step (1), said solution of chloride salt being freed from the hydrogen chloride contained therein by transfer of hydrogen chloride and water to said another solvent, and (b) recycling said another solvent loaded with hydrogen chloride and water to dehydration step (2) along with the loaded solvent from step (1).

4,036,940

RECOVERY OF IODINE

Martin M. McLane, Texas City, and Raymond A. Newsom, Dickinson, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,497

Int. Cl.² C01B 7/14

U.S. Cl. 423—503 **5 Claims**

1. A process for recovery of iodine from a process stream containing iodine or iodine-containing reaction products and a reducing agent which comprises passing said stream while in the vapor state in contact with a treating agent comprising alumina impregnated with the oxides of copper and chromium wherein the amount of copper oxide is from about 5 to about 25 wt.% as Cu and the amount of chromium oxide is from about 1 to about 5 wt.% as chromium, said contacting being effected at a temperature from about 300° to about 500° C, and thereafter regenerating said treating agent by heating it while passing oxygen, air, oxygen — inert gas or air — inert gas mixtures therethrough at a temperature from about 400° to about 600° C for a period from about 1 to about 12 hours.

4,036,941

PREPARATION OF FERRIC SULFATE SOLUTIONS

Bruce K. Boyles, Saxonburg, Pa., and John L. Crow, Jr., Savannah, Ga., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 8, 1976, Ser. No. 675,094

Int. Cl.² C01G 41/14

U.S. Cl. 423—558 **2 Claims**

1. A process for recovery of iron from an iron mud containing a mixture of gypsum and ferric hydroxide, which comprises contacting said gypsum and ferric hydroxide mixture with a stoichiometric equivalent based on the ferric hydroxide content of sulfuric acid of a concentration between 93 and 98% for a period of 1 to 12 hours, cooling the reaction mixture to a temperature between 25° and 60° C, removing the undissolved material and recovering the iron as a 25 to 50% ferric sulfate solution.

4,036,942

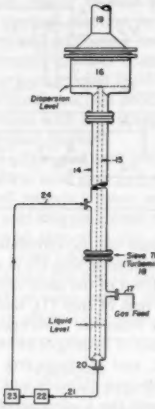
PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE AND MERCAPTANS FROM LIQUID AND GASEOUS STREAMS

Jacques Pierre Sibeud, Princeton, and Charles David Ruff, Highland Park, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Division of Ser. No. 166,894, July 28, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,482

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—573 16 Claims



1. A cyclic continuous process for the removal of hydrogen sulfide contained in gaseous streams, and the substantially quantitative catalytic conversion thereof to elemental sulfur, while inhibiting the buildup in the system of water-soluble by-products such as sulfates, which comprises contacting the gaseous stream with free oxygen gas and an aqueous solution of a water-soluble polyvalent metal chelate catalyst retaining the metal in soluble form in the aqueous solution, an inorganic alkali in an amount to adjust the pH to within the range from about 6.8 to about 10, and a strongly alkaline free organic amine in an amount within the range from about 0.1% to about 50% sufficient to inhibit water-soluble by-product formation, thereby concurrently forming sulfur and causing polyvalent metal catalyst oxidation and regeneration reactions in the oxidation-reduction metal chelate reaction system to proceed concurrently, while lessening buildup of water-soluble by-products in the catalyst solution; separating the sulfur from the aqueous metal chelate solution; and recycling the regenerated aqueous polyvalent metal chelate catalyst solution thereby recovered to contact another portion of the gaseous stream.

4,036,943

PROCESS FOR REMOVING SULFUR DIOXIDE FROM A GAS AND PRODUCING SULFUR THEREFROM

Marie-José Huron, Orsay; Yves Jacquin, Sevres, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 394,336, Sept. 4, 1973, abandoned. This application Nov. 18, 1975, Ser. No. 633,121

Claims priority, application France, Sept. 15, 1972, 72.32926

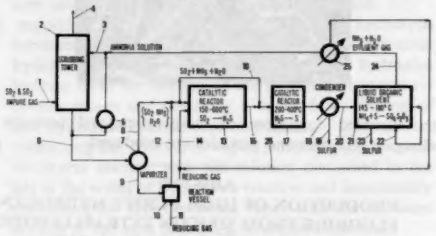
Int. Cl.[2] C01B *17/02, 1/02, 17/50*

U.S. Cl. 423—576 15 Claims

1. Process for removing sulfur dioxide from a gas containing the same, wherein

said gas is contacted, in a first step (a), with an aqueous ammonia absorbing solution, so as to absorb sulfur dioxide in the form of ammonium sulfites, then,

in a second step (b), the solution resulting from (a) is heated, so as to decompose the sulfites to a gas containing sulfur dioxide and ammonia, then, in a third step (c), the gas from step (b) is heated at 150°–600° C with gas capable of reducing SO_2 to H_2S, in contact with a catalyst for reducing SO_2 to H_2S so as to produce a gas essentially containing hydrogen sulfide, sulfur dioxide and ammonia in a molar ratio of H_2S to SO_2 of 1.7–2.3, and in a fourth step (d), the gas from (c), which has a molar ratio H_2S/SO_2 of from 1.7:1 to 2.3:1 is contacted at 200°–400° C with a catalyst for the reaction of H_2S and SO_2 to sulfur, and a gas containing free sulfur, ammonia and residual sulfur dioxide and hydrogen sulfide is recovered, and, in a fifth step (e), said gas recovered from step (d) is cooled to about 150° C in contact with an organic solvent in the liquid phase, so as to be made free of residual sulfur without substantial formation of ammonium thiosulfate or sulfate, and the resulting ammonia containing effluent gas is used to reconstitute the absorbing solution of (a).



4,036,944

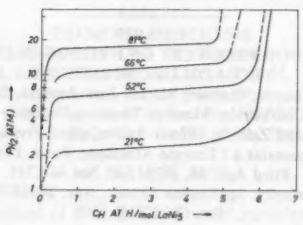
HYDROGEN SORBENT COMPOSITION AND ITS USE

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 17, 1976, Ser. No. 686,779

Int. Cl.[2] C01B *1/32, 1/35*

U.S. Cl. 423—648 R 10 Claims



1. A solid hydrogen sorbent composition comprising a sorbent having greater that 50% lanthanum pentanickel alloy and a binder matrix selected from the group consisting of (i) nonhydrogenated block copolymers having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, and (ii) selectively hydrogenated block copolymers having at least two monoalkeny! arene polymer end blocks C and at least one substantially completely hydrogenated diene polymer mid block D.

4,036,945

COMPOSITION AND METHOD FOR DETERMINING THE SIZE AND LOCATION OF MYOCARDIAL INFARCTS

Edgar Haber, Weston, Mass., assignor to The Massachusetts General Hospital, Boston, Mass.

Filed May 3, 1976, Ser. No. 682,483
Int. Cl.[2] A61K *29/00, 43/00;* G01T *1/161;* G21H *5/02*
U.S. Cl. 424—1 6 Claims

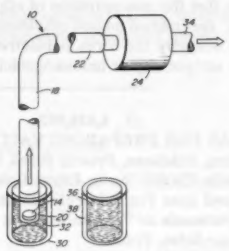
1. A composition comprising a physiologically acceptable injection vehicle and a member of the group consisting of radioactive labelled antibody for cardiac myosin and radioactive labelled lower molecular weight fragments of said antibody.

4,036,946

IMMUNOFLUOROMETRIC METHOD FOR MEASURING MINUTE QUANTITIES OF ANTIGENS, ANTIBODIES AND OTHER SUBSTANCES

Marcos Kleinerman, South Point Road, Webster, Mass. 01550

Filed Oct. 20, 1975, Ser. No. 623,567
Int. Cl.[2] G01N *21/52, 33/16*
U.S. Cl. 424—8 11 Claims



1. A method for measuring minute quantities of a substance comprising the steps of:

a. immobilizing molecules of an unlabelled reagent on a porous base stratum, said unlabelled reagent having a binding reaction with said substance to be measured;

b. immersing said base stratum into a solution containing said substance to be measured;

c. making said solution containing said substance to be measured flow through said immobilized molecules and said porous base stratum;

d. forming an intermediate layer having a distribution of said substance to be measured on said immobilized unlabelled reagent as said solution containing said substance to be measured flows through said immobilized molecules, particles of said substance to be measured being trapped by said immobilized molecules of said unlabelled reagent;

e. immersing said base stratum with said intermediate layer into a solution containing a labelled reagent;

f. making said solution containing said labelled solution flow through said intermediate layer and said base stratum;

g. forming a layer having a distribution of said labelled reagent on said intermediate layer, said labelled reagent being essentially said unlabelled reagent with a fluorescent label, molecules of said labelled reagent having a fluorescent label attaching to said trapped particles of said substance to be measured as said solution containing said labelled reagent flows through said intermediate layer; and

h. measuring said molecules of said labelled reagent for determining the concentration of said substance to be measured.

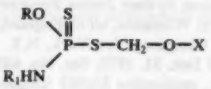
4,036,947

O-ALKYL-N-SUBUSTITUTED-S-HALOPHENOXYMETHYL-DITHIOPHOSPHORIC ACID ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Bernhard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 8, 1975, Ser. No. 638,875
Claims priority, application Germany, Dec. 10, 1974, 2458329
Int. Cl.[2] A01N *9/36;* C07F *9/24*
U.S. Cl. 424—217 11 Claims

1. An O-alkyl-N-substituted-S-halopenoxymethyldithiophosphoric acid ester-amide of the formula



in which

R is alkyl with 1 to 4 carbon atoms,

R_1 is alkyl with 1 to 6 or alkenyl with 2 to 5 carbon atoms and

X is chlorophenyl.

9. An insecticidal, acaricidal or nematocidal composition containing as active ingredients an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,036,948

L-ASCORBIC ACID TABLETS

Nobuyuki Kitamori, Suita; Tadashi Makino, Takatsuki, and Keiji Hemmi, Toyono, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sept. 3, 1975, Ser. No. 610,003
Claims priority, application Japan, July 24, 1975, 50-90742
Int. Cl.[2] A61K *9/32, 9/00, 31/375*
U.S. Cl. 424—32 9 Claims

1. L-ascorbic acid granules produced by spray-coating L-ascorbic acid powder, having a size such that it passes through a 200-mesh screen, with a solution of a binder under constant agitation in a fluidized-bed granulating apparatus until the amount of the binder has reached about 2 to about 4 weight percent relative to the L-ascorbic acid.

5. A method for producing L-ascorbic acid granules which comprises spray-coating L-ascorbic powder, having a size such that it passes through a 200-mesh screen, with a solution of a binder under constant agitation in a fluidized-bed granulating apparatus until the amount of the binder has reached about 2 to 4 weight percent relative to the L-ascorbic acid.

4,036,949

CLEAR DENTIFRICE

Daniel Colodney, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 504,798, Sept. 10, 1974, Pat. No. 3,906,090, which is a division of Ser. No. 287,001, Sept. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,240, April 30, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 610,962
The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.
Int. Cl.[2] A61K *7/16*
U.S. Cl. 424—49 11 Claims

1. A visually clear dentifrice comprising about 5-30% by weight of a dentally acceptable substantially water-insoluble particulate polishing agent in a gel vehicle having substantially the same refractive index as said polishing agent, said polishing agent being a synthetic amorphous complex alumino-silicate salt of sodium which contains about 0.1 to 3.3% by weight of the polishing agent of alumina, and in which the mole ratio of

silica to alumina is about 45:1 to 1500:1 said polishing agent having a refractive index of about 1.44–1.47, about 5 to 20% by weight of moisture and up to about 10% by weight sodium oxide and said polishing agent being substantially invisible in said gel vehicle.

4,036,950

ORAL PREPARATIONS

Eric Baines, Flixton; Sydney James Forshaw, Failsworth, and Kenneth Harvey, Wilmslow, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

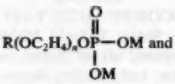
Filed Dec. 31, 1975, Ser. No. 645,744

Claims priority, application United Kingdom, Jan. 15, 1975, 1797/75

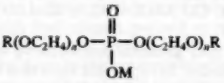
Int. Cl.[2] A61K *7/18, 7/22*

U.S. Cl. 424—54 15 Claims

1. An oral preparation comprising a dentally acceptable oral vehicle comprising a water-insoluble polishing material and dispersed in said vehicle a cationic antibacterial agent in amount of about 0.01–5% by weight based on the cationic portion thereof and about 0.05–5% by weight of an anionic phosphate ester surface active agent comprising a mixture of monoester of the formula



diester of the formula



wherein R is an alkyl group of 10–20 carbon atoms, *n* an integer from 1–6 and M is selected from the group consisting of hydrogen, alkali metal and ammonium, said oral preparation having a pH of at least about 6.

4,036,951

ULTRA-VIOLET FILTRATION WITH CERTAIN AMINOSALICYLIC ACID ESTERS

Alfred Halpern, Great Neck, and Ernest J. Sasmor, Yonkers, both of N.Y., assignors to Synergistics, Inc., New York, N.Y.

Continuation of Ser. No. 340,481, March 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 145,488, May 20, 1971, abandoned. This application Jan. 16, 1976, Ser. No. 649,891

Int. Cl.[2] A61K *7/44*

U.S. Cl. 424—60 14 Claims

1. The method of preventing solar burning in a human or animal comprising applying to the skin of said human or animal a composition containing 0.5 to 25 percent by weight of a compound selected from the group consisting of phenylorthoaminosalicylate, phenylmeta-aminosalicylate, phenyl-para-aminosalicylate and methyl-para-aminosalicylate and a carrier pharmaceutically acceptable for topical application prior to exposing said skin to solar radiation.

4,036,952

ETHYLENEIMINE INACTIVATED MICROORGANISMS

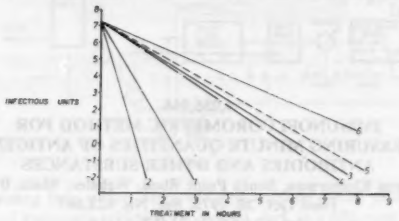
Kurt Bauer; Günther Wittmann; Manfred Mussgay, all of Tuebingen; Eckart Irion, Wuppertal, and Horst Geilhausen, Bensberg, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 559,970, March 19, 1975, abandoned, which is a division of Ser. No. 444,483, Feb. 21, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,038

Claims priority, application Germany, Feb. 24, 1973, 2309329

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 31 Claims



1. A virus suspension to which ethyleneimine has been added such that the concentration of ethyleneimine is 0.005% to 2% V/V, the residual unused ethyleneimine thereafter being destroyed, whereby the virus is inactivated without impairment to its antigenicity or immunogenicity.

4,036,953

PROCESS FOR PREPARING VACCINE ADJUVANT

Arlette Adam, Palaiseau, France; Frank M. Berger, Princeton, N.J.; Louis Chedid, Paris; Edgar Lederer, Sceaux, both of France, and Jean Francois Petit, Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 17, 1972, Ser. No. 307,614

Claims priority, application France, Nov. 19, 1971, 71.41610

Int. Cl.[2] A61K *39/02;* C12B *1/00;* C12D *13/02, 13/10*

U.S. Cl. 424—92 7 Claims

1. In a process for preparing a water-soluble immunological non-specific adjuvant for enhancing the effect of vaccine, the improvement which comprises

treating with a murolytic enzyme, in an aqueous solution, a suspension of Mycobacteria or Nocardia cells walls, said cell walls being substantially free of waxes, free lipids, free proteins and of nucleic acids,

separating the solid residue including cell walls residue from the digested residue and,

recovering the aqueous portion containing water-soluble immunological adjuvant, the adjuvant having reduced sensitizing action to tuberculin.

4,036,954

STABLE PROSTAGLANDIN E GROUP-CONTAINING FORMULATION

Masuo Murakami, Tokyo; Shigemi Kawahara, Higashikurume; Hiroitsu Kawata; Kiyoshi Okazaki, both of Kawagoe; Jun Sekino, Kashiwa, and Hidemi Shimizu, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,217

Claims priority, application Japan, Nov. 2, 1973, 48-123669; June 25, 1974, 49-72585

Int. Cl.[2] A61K *47/00, 31/215, 31/19*

U.S. Cl. 424—176 10 Claims

1. A process of preparing a stable prostaglandin E group-containing formulation which comprises adding to a prostaglandin E group compound an effective amount of at least one

member selected from the group consisting of hydroxypropyl cellulose, hydroxyethyl cellulose, carboxymethyl cellulose, water-soluble dextrin and dextran and subjecting the resulting mixture to lyophilization.

7. A process according to claim 1 in which 5 - 250 mg. of said water-soluble dextrin and dextran is added per 0.05 mg. of said prostaglandin E group compound, and 0.1 - 150 mg. of said cellulose derivative is added to 0.05 mg. of said prostaglandin E group compound.

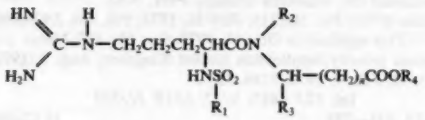
4,036,955

N^2-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Shosuke Okamoto, both of, Japan

Filed July 22, 1976, Ser. No. 707,536
Int. Cl.[2] A61K *37/00*
U.S. Cl. 424—177 **10 Claims**

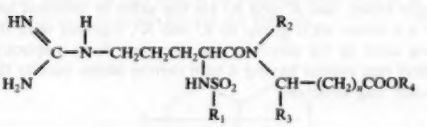
1. An N^2-[naphthalenesulfonyl-L-argininamides] Naphthalenesulfonyl-L-argininamide compound having the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano, C_1-C_{10} alkyl, C_1-C_{10} alkoxy and C_2-C_{20} dialkylamino; R_2 is selected from the group consisting of furfuryl, furylmethyl, tetrahydrofurfuryl and tetrahydro-3-furylmethyl; R_3 is hydrogen or C_1-C_5 alkyl; R_4 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_7-C_{12} aralkyl and C_6-C_{10} aryl; and *n* is an integer of 0, 1 or 2.

10. A method of inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N^2-naphthalenesulfonyl-L-compound having the formula (I):



(I)

or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from a group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano, C_1-C_{10} alkyl, C_1-C_{10} alkoxy and C_2-C_{20} dialkylamino; R_2 is selected from the group consisting of furfuryl, 3-furylmethyl, tetrahydrofurfuryl and tetrahydro-3-furylmethyl; R_3 is hydrogen or C_1-C_5 alkyl; R_4 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_7-C_{12} aralkyl and C_6-C_{10} aryl; and *n* is an integer of 0, 1 or 2.

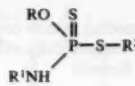
4,036,956

O,S,N-TRI-ALIPHATIC HYDROCARBON-THIONOTHIOLPHOSPHORIC ACID ESTER AMIDES AND PESTICIDAL COMPOSITION AND METHOD

Claus Stölzer, Wuppertal-Vohwinkel; Bernhard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Günter Unterstenhöfer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 414,601, Nov. 8, 1973, Pat. No. 3,903,209, which is a division of Ser. No. 160,185, July 6, 1971, Pat. No. 3,793,407. This application Jan. 30, 1975, Ser. No. 545,658
Claims priority, application Germany, July 11, 1970, 2034475
Int. Cl.[2] A01N *9/36*; C07F *9/22*
U.S. Cl. 424—210 **15 Claims**

1. A thionophosphoric acid ester amide of the formula



in which

R and R^1 each is an alkyl or alkenyl radical with up to 6 carbon atoms, optionally substituted with at least one halo, phenyl, cyano, alkoxy, alkylmercapto, phenylmercapto or naphthylmercapto radical, the mercapto radicals being optionally chloro-or cyano-substituted, and

R^2 is an alkynyl radical with up to 6 carbon atoms optionally substituted with at least one halo, phenyl, alkoxy, alkylmercapto, phenylmercapto or naphthylmercapto radical, the mercapto radicals being optionally chloro-substituted, or an alkyl or alkenyl radical with up to 6 carbon atoms substituted with a cyano radical or substituted with a cyano-substituted alkylmercapto, chloro substituted alkylmercaptor, phenylmercapto or naphthylmercapto radical.

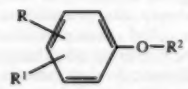
4,036,957

PHENOXY COMPOUNDS IN COMBINATIONS TO SUPPRESS GASTRIC BLEEDING IN ASPIRIN THERAPY

Reevis Stancil Alphin, and John Wesley Ward, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Nov. 18, 1975, Ser. No. 633,044
Int. Cl.[2] A61K *31/625*
U.S. Cl. 424—232 **3 Claims**

1. The method of treating inflammatory conditions in mammals which comprises administering to said mammals an effective amount of a combination of from about 67 to 95% by weight aspirin and from about 5 to 33% by weight of a phenoxy compound having the formula:



wherein;

R is selected from the group consisting of hydrogen, chlorine, bromine, fluorine, lower-alkyl, lower-alkoxy, or trifluoromethyl,

R^1 is selected from the gruup consisting of hydrogen, chlorine, bromine, fluorine, lower-alkyl or lower-alkoxy,

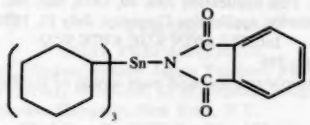
and R^2 is $—CH_2—CHCH_2NHCOO$.

4,036,958
INSECTICIDAL AND MITICIDAL ACTIVE ISOTHIURONIUM TRICYCLOHEXYL TIN IMIDE

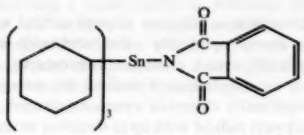
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 6, 1975, Ser. No. 619,882
Int. Cl.[2] A01N 9/00; C07D 209/34
U.S. Cl. 424—245 3 Claims

1. The compound having the formula



2. A method of controlling insects consisting of applying to the habitat thereof an insecticidally effective amount of the compound having the formula

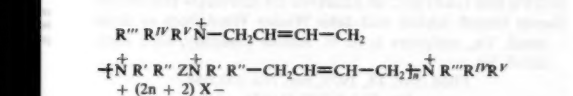


4,036,959
MICROBIOCIDAL CAPPED POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Oct. 17, 1975, Ser. No. 623,402
The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.
Int. Cl.[2] A01N 9/22; C07D 211/06
U.S. Cl. 424—248.56 4 Claims

1. The compound



wherein R′ and R″ are selected from the group consisting of (a) primary or secondary alkyls having 1 to 20 carbon atoms, (b) hydroxy or dihydroxy derivatives of R′ and R″, (c) benzyl, and (d) benzyl having at least one alkyl group bonded to the benzene ring, with the total sum of alkyl carbon atoms attached to the benzene ring being less than 7; wherein (R'''), (R^{IV}) and (R^{V}), taken together with N, form a heterocyclic amino radical selected from the group consisting of N-lower alkyl morpholino, quinolino, N-lower alkyl pyrrolidino, N-lower alkyl piperidino, N-lower alkyl homopiperidino, N-lower alkyl isoquinolino, and N,N-di-lower alkyl benzylamino; wherein Z consists of 1 to 3 aliphatic divalent radicals, each of which has 2 to 10 carbon atoms with each aliphatic radical containing 0 to 2 double bonds and 0 to 2 hydroxy substituents; wherein X is selected from the group consisting of chlorine and bromine; and wherein n is an integer of about 2 to about 30.

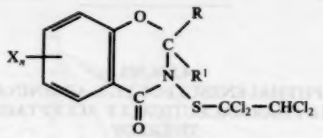
3. A method of inhibiting the growth of microorganisms selected from the group consisting of bacteria and fungi which comprises applying to said microorgansims an effective amount for inhibiting said microorganisms of the compound of claim 1.

4,036,960
1,3-BENZOXAZIN-4-ONE DERIVATIVES AND THEIR USE AS OVICIDES

David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 29, 1975, Ser. No. 645,000
Int. Cl.[2] A01N 9/00, 9/22; C07D 265/00, 273/00
U.S. Cl. 424—248.5 7 Claims

1. A compound of the formula



wherein X is fluorine, chlorine or bromine, or alkyl of 1 to 3 carbon atoms, n is 0, 1 or 2, and R and R^1 are individually hydrogen, methyl or ethyl.

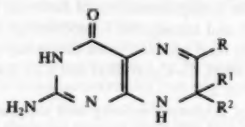
6. An ovicidal composition comprising an ovicidally effective amount of the compound of claim 1 and an inert pesticide carrier.

4,036,961
PHARMACEUTICAL COMPOSITIONS CONTAINING PTERIDINES

Alexander Stuart, Bromley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 382,715, July 26, 1973, Pat. No. 3,939,160. This application Oct. 14, 1975, Ser. No. 622,226
Claims priority, application United Kingdom, Aug. 1, 1972, 35815/72; Feb. 1, 1973, 5189/73
Int. Cl.[2] A01N 9/22; A61K 31/505
U.S. Cl. 424—251 16 Claims

1. A pharmaceutical composition for treating bacterial or protozoal infections comprising a compound of Formula (I), a tautomer form thereof or a pharmaceutically acceptable salt of the compound or its tautomer



(I)

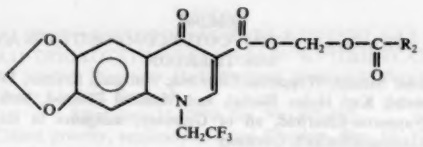
in an amount effective for treating bacterial or protozoal infections and a pharmaceutically acceptable carrier therefore where R is a lower alkyl group substituted with one or more halogen atoms, and R^1 and R^2 are the same or different and each is a lower alkyl group or R^1 and R^2, together with the carbon atom in the pterdine ring structure, form a spirocycloalkyl ring system having 4 to 6 carbon atoms outside the pteridine ring structure.

4,036,962
6,7-METHYLENEDIOXY-1-(2,2,2-TRIFLUOROETHYL)-4(1H)-QUINOLONE-3-CARBOXYLIC ACID AND ITS SALTS AND ESTERS

Kyu Tai Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 496,851, Aug. 12, 1974, abandoned. This application May 16, 1975, Ser. No. 578,137
Int. Cl.[2] C07D 215/56
U.S. Cl. 424—258 6 Claims

1. A compound of the formula



wherein R_2 is tertiary alkyl of 4–10 carbon atoms wherein the carbon adjacent to the carbonyl is the tertiary carbon.

3. A method of treating bacterial infection in a warm-blooded animal which comprises administering to the warm-blooded animal an effective antibacterial amount of a compound of claim **1.**

5. A pharmaceutical composition comprising a suitable pharmaceutical carrier and an effective antibacterial amount of a compound of claim **1.**

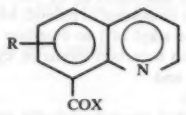
4,036,963

DERIVATIVES OF QUINOLINE-8-CARBOXYLIC ACID HAVING PESTICIDAL ACTION

Franco Gialdi, Pavia; Angelo Longoni; Giannantonio Michieli, both of Milan, and Riccardo Ponci, Pavia, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Aug. 5, 1974, Ser. No. 494,976
Claims priority, application Italy, Aug. 6, 1973, 27580/73
Int. Cl.² C07D *215;* A61K *31/47*
U.S. Cl. 424—258 **2 Claims**

1. A composition for combatting infestations due to *Macrosiphum solani, Aphis fabae, Leptinotarsa decemlineata, Pieris brassicae,* and *Spodoptera littoralis,* said composition consisting essentially of an aqueous dispersion of at least 0.05% by weight of an insecticide having the formula

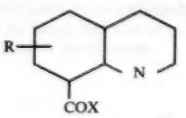


in which

R is selected from the group consisting of H, halogen, and alkyl groups having from 1 to 3 carbon atoms; and

X represents NH_2 or OY in which Y is selected from the group consisting of H, alkaline metals, alkaline earth metals; amines, and their quinoline salts with inorganic acids; and n-alkyl quinolinium salts.

2. The method of combatting infestations due to *Macrosiphum solani, Aphis fabae, Leptinotarsa decemlineata, Pieris brassicae,* and *Spodoptera littoralis,* which consists in applying to the habitat of said insects an aqueous dispersion of at least 0.5% of an insecticide having the formula



in which

R is selected from the group consisting of H, halogen, and alkyl groups having from 1 to 3 carbon atoms; and

X represents NH_2 or OY in which Y is selected from the group consisting of H, alkaline metals, alkaline earth metals, amines, and their quinoline salts with inorganic acids and n-alkyl quinolinium salts.

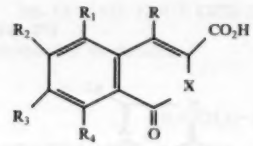
4,036,964

ISOCARBOSTYRIL-3-CARBOXYLIC ACID DERIVATIVES FOR THE PROPHYLAXIS OF ASTHMA, HAYFEVER AND RHINITIS

Derek Richard Buckle, Redhill; Barrie Christian Charles Cantello, Horsham, and Harry Smith, Maplehurst near Horsham, all of England, assignors to Beecham Group Limited, England

Division of Ser. No. 510,803, Sept. 3, 1974, Pat. No. 3,975,535.
This application Dec. 24, 1975, Ser. No. 644,132
Claims priority, application United Kingdom, Oct. 11, 1973, 47485/73
Int. Cl.² A61K *31/47*
U.S. Cl. 424—258 **45 Claims**

1. A pharmaceutical composition in a form suitable for oral, parenteral or insufflation administration to humans which comprises a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof or hydrate thereof, wherein X is NH, R is hydrogen, lower alkyl, cyclopentyl, cyclohexyl or cycloheptyl, R_1, R_2, R_3 and R_4 are each hydrogen, lower alkyl, lower alkoxy, cyclohexyl, phenyl, benzyl, halogen, carboxyl, lower alkoxycarbonyl, lower alkanoyloxymethoxycarbonyl, lower α-alkanoyloxyethoxycarbonyl or acetoxy, or R_1 and R_2, R_2 and R_3, or R_3 and R_4 taken together with the carbon atoms to which they are attached form a 1,2-phenylene or 1,2-cyclohexylene ring, in an amount sufficient to be effective for the prophylaxis of asthma, hayfever or rhinitis in combination with a pharmaceutically acceptable diluent or carrier suitable for said administration form.

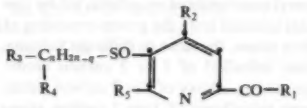
4,036,965

5-SULFINYL-2-PYRIDINECARBOXYLIC ACIDS

Neville Finch, West Orange, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 4, 1976, Ser. No. 663,939
Int. Cl.² A61K *31/455;* C07D *213/32*
U.S. Cl. 424—266 **8 Claims**

1. A compound of the formula



wherein R_1 is hydroxy, lower alkoxy, amino, mono- or di-lower alkylamino or hydrazino, R_2 is hydrogen, lower alkyl, lower alkoxy or halo, R_3 is hydrogen, lower alkoxy, lower alkylsulfinyl, halogeno, amino, mono- or di-lower alkylamino, phenyl or phenyl substituted by one or more than one member selected from the group consisting of lower alkyl, lower alkoxy, halo, trifluoromethyl, cyano, COR_1 and amino, R_4 is hydrogen, hydroxy or COR_1, R_5 is hydrogen, lower alkyl, lower alkoxy, halo or COR_1, n is an integer from 1 to 7, q is 1 and which C_nH_{2n-q}-moiety separates R_3 being lower alkoxy, lower alkyl-sulfinyl, halogeno, amino, mono- or di-lower alkylamino, and R_4 being hydroxy, from the SO-group by at least two carbon atoms, or a therapeutically useful salt thereof.

7. A hypotensive pharmaceutical composition comprising a hypotensively effective amount of a compound as claimed in claim **1,** together with pharmaceutical excipient.

4,036,966

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Krämer, Wuppertal-Barmen; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

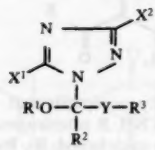
Division of Ser. No. 532,191, Dec. 12, 1974, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 646,192

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.[2] A61K *31/41*

U.S. Cl. 424—269 24 Claims

12. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloaikoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same of different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^3 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino, or aralkyl of 6 to 10 carbon atoms in the aryl moiety and 1 or 2 carbon atoms in the alkyl moiety, unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino; and

Y is CO;

in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,036,967

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Krämer, Wuppertal; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

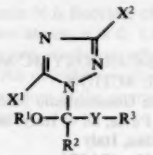
Division of Ser. No. 532,191, Dec. 12, 1974, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 645,946

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.[2] A61K *31/41*

U.S. Cl. 424—269 28 Claims

14. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R^3 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms; and

Y is $>C=NOH$;

in combination with a pharmaceutically acceptable nontoxic, inert carrier.

4,036,968

PHARMACEUTICAL TABLET

David Cedric Sharland, Worthing, England, assignor to Beecham Group Limited, England

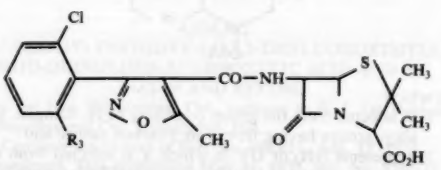
Division of Ser. No. 485,163, July 2, 1974, Pat. No. 3,996,365. This application Dec. 29, 1975, Ser. No. 644,424

Claims priority, application United Kingdom, July 12, 1973, 33214/73

Int. Cl.[2] A61K *31/43*

U.S. Cl. 424—271 6 Claims

1. A pharmaceutical tablet which comprises 10% to 70% urea and an antibacterially effective amount of at least 20% of a penicillin of the formula



wherein R_3 is a hydrogen, chlorine or fluorine atom, or a pharmaceutically acceptable salt thereof.

4,036,969

2,12-DIOXO-7-HYDROXYMETHYL-9-PHENYL-1-AZA-5,8,11-TRIOXOTETRACYCLO[9.2.0.0^{6,13}0^{,6,9}]TRIDECANE

Irene Stirling, Worcester Park, England, assignor to Beecham Group Limited, England

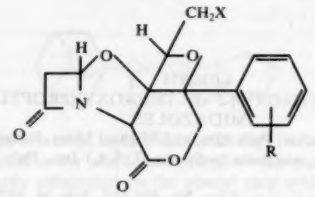
Filed June 11, 1976, Ser. No. 695,102

Claims priority, application United Kingdom, Dec. 15, 1975, 51200/75

Int. Cl.^{2} C07D *498/04;* A61K *31/42*

U.S. Cl. 424—272 3 Claims

1. A compound of the formula (II):



(II)

wherein R is hydrogen and X is hydroxy.

2. A pharmaceutical composition useful for effecting β-lactamase inhibition in humans and other mammals which comprises a β-lactamase inhibitory amount of the compound of claim 1 in combination with a pharmaceutically acceptable carrier.

4,036,970

IMIDAZOL-1-YL PROPANE DERIVATIVES

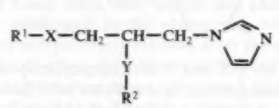
Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,743, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,600

Int. Cl.^{2} A61K *31/415;* C07D *233/60*

U.S. Cl. 424—273 43 Claims

1. A compound of the formula:



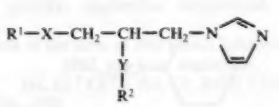
(I)

wherein:

R^1 and R^2 are independently benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;

X and Y are independently oxygen or sulfur with the proviso that Y is not oxygen when R^2 is phenyl or substituted phenyl; and the antimicrobial acid addition salts thereof.

41. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula



(I)

wherein:

R^1 and R^2 independently benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;

X and Y are independently oxygen or sulfu · with the proviso that Y is not oxygen when R^2 is phenyl and substituted phenyl; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,971

AMIDINO COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

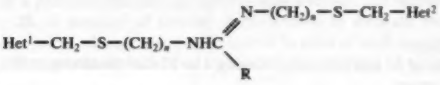
Filed Feb. 19, 1975, Ser. No. 551,220

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

Int. Cl.^{2} A61K *31/415;* C07D *233/64*

U.S. Cl. 424—273 7 Claims

1. A compound of the formula:



wherein Het^1 and Het^2 are independently imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; *n* is 2 or 3; and R is lower alkyl or phenyl optionally substituted by hydroxy or mercapto, or a pharmaceutically acceptable acid addition salt thereof.

7. A method of blocking histamine H_2-receptors, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim 1.

4,036,972

2-(N-THIENYLMETHYL-PHENYLAMINO)-IMIDAZOLINES-(2) AND SALTS THEREOF

Helmut Stahle; Herbert Koppe; Werner Kummer, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

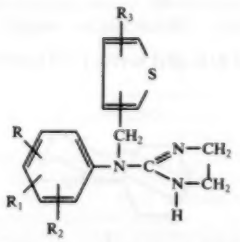
Continuation-in-part of Ser. No. 441,451, Feb. 11, 1974, Pat. No. 3,937,717. This application Aug. 25, 1975, Ser. No. 607,258

Claims priority, application Germany, Feb. 23, 1973, 2308883

Int. Cl.^{2} C07D *409/12;* A61K *31/415*

U.S. Cl. 424—273 11 Claims

1. a compound of the formula



wherein R, R_1 and R_2 are each hydrogen, fluorine, chlorine or bromine, but other than all hydrogen at the same time, and

R_3 is hydrogen, methyl or ethyl.

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

9. A method of relieving pain in warm-blooded animals, which comprises administering to warm-blooded animals an analgesically effective amount of at least one compound of claim **1.**

4,036,973

IMIDAZOL-1-YL PROPANE DERIVATIVES

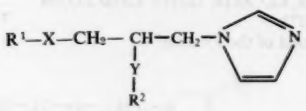
Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,612, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,800

Int. Cl.[2] A61K *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 **41 Claims**

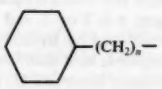
1. A compound of the formula:



(I)

wherein:

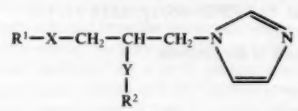
one of R^1 and R^2 is alkyl having 1 to 12 carbon atoms or the group



in which *n* is 0 to 3, and the other of R^1 and R^2 is benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;

X and Y are independently oxygen or sulfur with the proviso that Y is not oxygen when R^2 is phenyl or substituted phenyl; and the antimicrobial acid addition salts thereof.

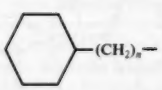
39. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula



(I)

wherein:

one of R^1 and R^2 is alkyl having 1 to 12 carbon atoms or the group



in which *n* is 0 to 3, and the other of R^1 and R^2 is benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substitutents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;

X and Y are independently oxygen or sulfur with the proviso that Y is not oxygen when R^2 is phenyl or substituted phenyl; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,974

1-{2'-[R'-THIO(OXY)]-3'-(R²-THIO(OXY)]PROPYL}-IMIDAZOLES

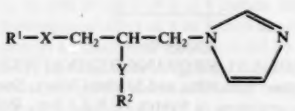
Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,611, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,840

Int. Cl.[2] A61K *31/415;* **C07D** *233/60*

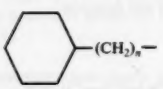
U.S. Cl. 424—273 **28 Claims**

1. A compound of the formula



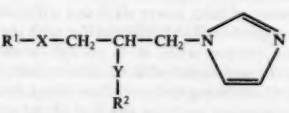
(I)

wherein R^1 and R^2 are independently alkyl having 1 to 12 carbon atoms or the group



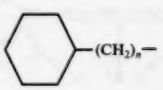
in which *n* is 0 to 3; X and Y are independently oxygen or sulfur; and the antimicrobial acid addition salts thereof.

26. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula



(I)

wherein R^1 and R^2 are independently alkyl having 1 to 12 carbon atoms or the group



in which *n* is 0 to 3 and X and Y are independently oxygen or sulfur; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,975
1-[2-(1-ADAMANTYL)-2-(R-THIO)ETHYL]IMIDAZOLES AND 1-[2-(1-ADAMANTYL)-2-(R-OXY)ETHYL]IMIDAZOLES

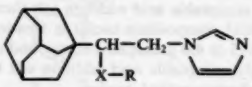
Keith A. M. Walker, Palo Alto, and Stefan Howard Unger, Cupertino, both of Calif., assignors to SXyntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,441, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 665,012

Int. Cl.[2] **A61K** *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 **28 Claims**

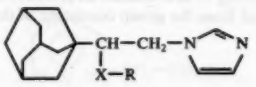
1. A compound of the formula:



(I)

wherein R is alkyl, cycloalkyl, cycloalkyl lower alkyl, phenyl or phenyl lower alkyl, said phenyl and phenyl lower alkyl optionally substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl and wherein lower alkyl has 1 to 4 carbon atoms, alkyl has 1 to 12 carbon atoms and cycloalkyl has 5 to 7 carbon atoms; X is oxygen or sulfur with the proviso that X is not oxygen when R is phenyl or substituted phenyl; and the antimicrobial acid addition salts thereof.

26. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula



(I)

wherein R is alkyl, cycloalkyl, cycloalkyl lower alkyl, phenyl or phenyl lower alkyl, said phenyl and phenyl lower alkyl optionally substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl and wherein lower alkyl has 1 to 4 carbon atoms, alkyl has 1 to 12 carbon atoms and cycloalkyl has 5 to 7 carbon atoms; X is oxygen or sulfur with the proviso that X is not oxygen when R is phenyl or substituted phenyl; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,976
SUBSTITUTED IMIDAZOLINYLAMINO-INDAZOLES

Peter Neumann, Bern, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 456,521, April 1, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,823

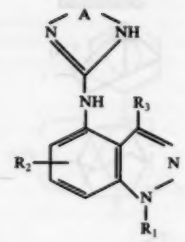
Claims priority, application Switzerland, Apr. 5, 1973, 4916/73

The portion of the term of this patent subsequent to Nov. 12, 1987, has been disclaimed.

Int. Cl.[2] **C07D** *403/12;* **A61K** *31/415*

U.S. Cl. 424—273 **29 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or alkyl of 1 to 3 carbon atoms,

R_2 is hydrogen, halogen, hydroxy, or alkyl, alkoxy or alkylthio each of 1 to 3 carbon atoms, and

R_3 is hydrogen, halogen, alkyl or alkoxy each of 1 to 3 carbon atoms, or hydroxy, and

A is dimethylene, wherein one hydrogen atom may be replaced by hydroxyl or alkyl of 1 to 3 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

25. A method of treating hypertension in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim **1.**

4,036,977
POLYCYCLOPHENYLPYRROLIDINES, THEIR COMPOSITIONS AND USE

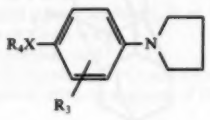
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 507,462, Sept. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,402, Nov. 16, 1973, abandoned. This application May 12, 1975, Ser. No. 576,342

Int. Cl.[2] **C07D** *207/06;* **A61K** *31/40, 31/135, 31/325*

U.S. Cl. 424—274 **23 Claims**

1. A compound of the formula

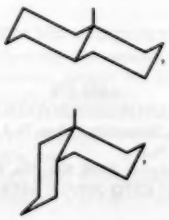


wherein

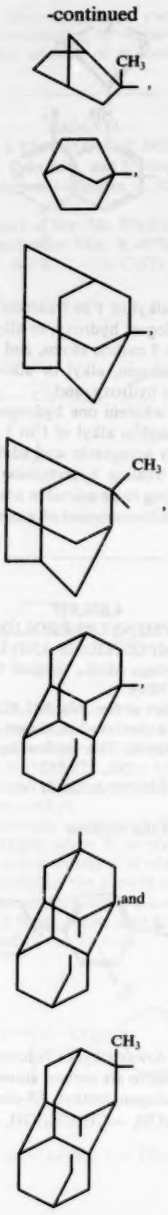
X is O, S, CH_2, N-lower alkyl or N-lower alkyl carboxyacyl, each alkyl of one to six carbon atoms, inclusive;

R_3 is hydrogen, halogen, methyl, 2,6-dimethyl, 3,5-dimethyl, —CHO, $—CH_2OH$, $—CH(CH_3)OH$, $—CH_2SCH_3$, or pyrrolidino;

R_4 is



-continued



and pharmaceutically acceptable acid addition salts thereof.

4,036,978

ETHANODIBENZOINDOLES

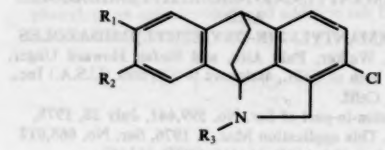
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed May 6, 1976, Ser. No. 683,920

Int. Cl.[2] C07D *209/58;* A61K *31/40*

U.S. Cl. 424—274 **4 Claims**

1. A compound of the formula:



where

R_1 and R_2 each independently are hydrogen or straight chain lower alkyl of 1 to 3 carbon atoms and

R_3 is methyl or ethyl or

a pharmaceutically acceptable acid addition salt thereof.

3. A pharmaceutical composition useful in treating inflammation comprising 0,5 to 4,0 grams of a compound of claim **1** or a pharmaceuticaly acceptable acid addition salt thereof in association with a pharmaceutical carrier.

4,036,979

COMPOSITIONS CONTAINING 4,5,6,7-TETRAHYDROBENZ[B]THIEN-4-YL-UREAS OR DERIVATIVES AND METHODS OF ENHANCING GROWTH RATE

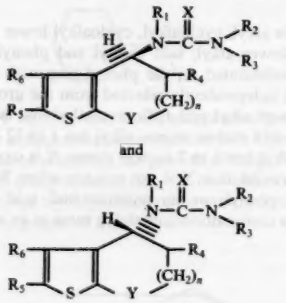
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 572,492, April 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,826, Jan. 25, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,252

Int. Cl.[2] A61K *31/38*

U.S. Cl. 424—275 **76 Claims**

1. A method for improving the feed efficiency and enhancing the growth rate of veterinary homothermic animals which comprises administering to said animals an effective amount of a compound selected from the group consisting of those of the formulae:

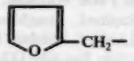


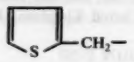
and

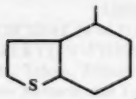
wherein X is oxygen or sulfur; n is the integer 1 or 2; Y is a divalent radical selected from the group consisting of those of the formulae:

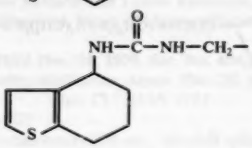
R_1 is hydrogen or alkyl C_1-C_4; R_3 is selected from the group consisting of hydrogen, alkyl C_1–C_4, cycloalkyl C_3–C_6, allyl, 2-propynyl, benzyl and β-phenethyl; R_4 is hydrogen or alkyl C_1–C_4; R_5 is hydrogen, chloro, bromo or iodo; R_6 is hydrogen or alkyl C_1–C_4; R_2 is selected from the group consisting of the substituents listed in the following table:

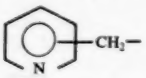
hydrogen
alkyl C_1–C8
cycloalkyl C_3–C6
allyl
2-propynyl
hydroxy
alkoxy C_1–C6
allyloxy
methoxymethyl
phenoxy
$-CH_2-CH(OR)2$
$-CH_2-CF3$
$-CH_2-CN$
$-NH-CO_2R$
$-O-CH_2-CO_2H$
$-CO_2C_2H5$

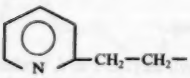


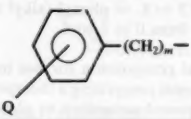








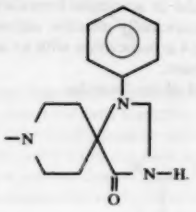




wherein R is alkyl C_1–C_4, *m* is 0, 1 or 2, and Q is selected from the group consisting of the substituents listed in the following table:

m = 0	m = 1	m = 2
4-nitro	hydrogen	hydrogen
3- or 4-methoxy	4-chloro	
4-ethoxy	4-methoxy	
4-chloro		
4-butoxy		
2,4-dimethyl		
2,4-dichloro		
2,5-dimethoxy		

and R_2 and R_3 taken together with the associated N(itrogen) is selected from the group consisting of morpholino, piperidino, pyrrolidino, 4-(4-methoxyphenyl)piperazino, 1,2,3,4-tetrahydroquniolino and the moiety of the formula:



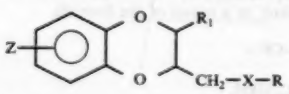
4,036,980

ETHER SUBSTITUTED BENZODIOXAN DERIVATIVES

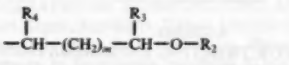
Fritz Schaub, Basel, and Hanspeter Schelling, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 28, 1975, Ser. No. 581,509
Claims priority, application Switzerland, June 5, 1974, 7664/74; Apr. 17, 1975, 4908/75
Int. Cl.[2] C07D *319/08*; A01N *9/28*
U.S. Cl. 424—278 29 Claims

1. A compound of the formula



in which R is a group of formula A,



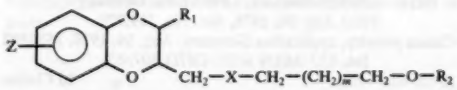
A

wherein R_2 is cyclopentyl or cyclohexyl
each of R_3 and R_4, independently, is hydrogen or C_1–C_4 alkyl,
each of R_5 and R_6, independently, is hydrogen or methyl, *m* is an integer of 1 to 6,
and each of n and p, independently, is an integer 1 or 2,
R_1 is hydrogen or C_1-C_7 alkyl,
X is oxygen or sulphur, and
Z is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_7 alkoxycarbonyl, halogen or nitro, or a group of the formula,

$R_7OOC-CH=CH-$

wherein R_7 is C_1–C_6 alkyl.

4. A compound of the formula:



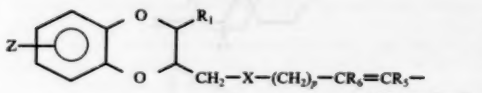
wherein
R_2 is C_1–C_{11} alkyl, a C_3–C_{11} mono- or multi-unsaturated aliphatic hydrocarbon radical, C_5–C_7 cycloalkyl, C_1–C_6 alkyl-C_5–C_7 cycloalkyl or phenyl,
m is 1 to 6,
R_1 is hydrogen or C_1–C_7 alkyl,
X is oxygen or sulfur, and
Z is hydroden, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_7 alkoxycarbonyl, halo or nitro, or a group of the formula,

$R_7OOC-CH=CH-$

wherein R_7 is C_1–C_6 alkyl.

12. An insecticidal or acaricidal formulation comprising an insecticidally or acaricidally effective amount of a compound according to claim **4** in association with an insecticide or acaricide carrier or diluent.

21. A compound of the formula:



wherein

R_2 is C_1–C_{11} alkyl, a C_3–C_{11} mono- or multi- unsaturated aliphatic hydrocarbon radical, C_5–C_7 cycloalkyl, C_1–C_6 alkyl-C_5–C_7 cycloalkyl or phenyl,

each of

R_5 and R_6 is independently hydrogen or methyl,

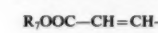
each of

n and p is independently 1 or 2,

R_1 is hydrogen or C_1–C_7 alkyl,

X is oxygen or sulfur, and

Z is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_7 akloxycarbonyl, halo, nitro, or a group of the formula,



wherein R_7 is C_1–C_6 alkyl.

28. A method of combating insects or acarids in a locus which comprises applying to the locus an insectically- or acaricidally-effective amount of a compound of claim **21.**

4,036,981

METHOD FOR TREATING INFLAMMATION

Marvin M. Goldenberg, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed July 12, 1976, Ser. No. 704,122

Int. Cl.[2] A61K *31/34*

U.S. Cl. 424—285 **1 Claim**

1. A method of treating inflammation which comprises orally administering to a host in need thereof an anti-inflammatorily amount of trans-5-(4-chlorophenyl)-2-furanacrylic acid in acceptable pharmaceutical dosage form.

4,036,982

O-ALKYL-S-ALKYL-O-[2-CARBALKOXY-BENZOFURAN(3)YL]-THIONOTHIOL-PHOSPHORIC ACID ESTERS

Hellmut Hoffmann; Hans-Jochem Riebel, both of Wuppertal, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

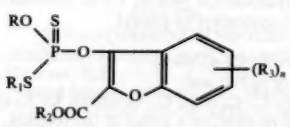
Filed July 30, 1976, Ser. No. 709,979

Claims priority, application Germany, Aug. 16, 1975, 2536502

Int. Cl.[2] A01N *9/36;* **C07D** *307/85*

U.S. Cl. 424—285 **10 Claims**

1. An O-alkyl-S-alkyl-O-[2-carbalkoxy-benzofuran(3)yl]-thionothiolphosphoric acid ester of the formula



(I)

in which

R, R_1 and R_2 each independently is alkyl with 1 to 6 carbon atoms,

R_3 is halogen, or alkyl or alkoxy with 1 to 4 carbon atoms, and

n is an integer from 0 to 4.

8. An insecticidal composition containing as active ingredient an insecticidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,036,983

FERROCENE COMPOUNDS AND PHARMACEUTICAL COMPOSITION FOR USE IN TREATMENT OF IRON DEFICIENCY IN AN ANIMAL

David Rutherford, Loughborough; Peter Williams, Holmes Chapel, and Richard Anthony Raphael, Loughborough, all of England, assignors to Fisons Limited, London, England

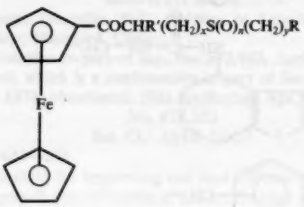
Filed Jan. 7, 1976, Ser. No. 647,133

Claims priority, application United Kingdom, Jan. 15, 1975, 1682/75

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—295 **14 Claims**

1. A compound of formula I,



I

in which

R is a cycloalkyl group,

n is 0, 1 or 2,

R′ is hydrogen, phenyl, alkyl C 1 to 6, cycloalkyl C 4 to 6, alkyl-cycloalkyl C 5 to 8, or phenyl-(alkyl C 1 to 6),

x is a whole number from 0 to 8, and

y is a whole number from 0 to 5.

12. A pharmaceutical composition for use in treatment of iron deficiency in an animal comprising a therapeutically effective amount of a compound according to claim **1,** as active ingredient, in combination with a pharmaceutically acceptable adjuvant, diluent or carrier.

4,036,984

SOIL FUNGI INHIBITING AGENT

Hiroki Takahashi; Kiyomi Ozawa; Yoshihiro Iwasawa, all of Funabashi; Masayuki Ogawa, Minami; Shigekatu Okamoto, Minami; Yoshinori Ochiai, Minami, and Eizo Katakura, Minami, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

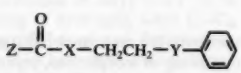
Filed Apr. 28, 1975, Ser. No. 571,925

Claims priority, application Japan, Apr. 30, 1974, 49-048420; Mar. 15, 1975, 50-031416

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—311 **8 Claims**

1. A method of protecting a plant or a crop from damage due to soil fungi which comprises applying to the soil or to the crop plants a fungicidally effective amount of at least one of the followng compounds having the general formula:



wherein Z is selected from the group consisting of hydrogen,

alkyl containing 1 to 21 carbon atoms and alkenyl containing 2 to 6 carbon atoms and both X and Y are oxygen.

4,036,985

MONO SUBSTITUTED MALONIC ACID DIAMIDES AND PROCESS OF PREPARING THEM

Jose Amato; Marta Propker; Magdalena Julia Beatriz Pongracz, and Jorge Luis Jose Szabo, all of Humahuaca 4065, Buenos Aires, Argentina

Filed July 16, 1975, Ser. No. 596,354
Int. Cl.[2] C07C *103/44*
U.S. Cl. 424—320 9 Claims

1. New 2-monosubstituted malonic acid diamides of the formula

$$RCH[CONH(CH_2)_3N(CH_3)_2]_2$$

wherein R is a member of the group consisting of phenyl, benzyl, and lower alkyl of 1–4 carbons.

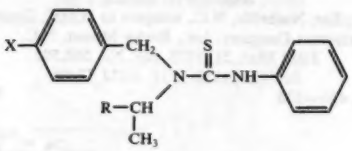
4,036,986

FUNGICIDAL N-(4-HALOBENZYL)-N-SEC. ALKYL-N'-PHENYLTHIOUREAS

Yasuo Yamada, Tokyo, Japan; Junichi Saito, Wuppertal, Germany; Tatsuo Tamura, and Yoshio Kurahashi, both of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 24, 1975, Ser. No. 644,242
Claims priority, application Japan, Dec. 24, 1974, 49-147526
Int. Cl.[2] A01N *9/12*
U.S. Cl. 424—322 10 Claims

1. An N-(4-halobenzyl)-N-sec. alkyl-N'-phenylthiourea of the formula



in which

R is a C_1–C_6 alkyl radical, and

X is a halogen atom.

8. A fungicidal composition containing as the active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

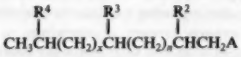
4,036,987

CONTROL OF NEMATODES AND OTHER HELMINTHS

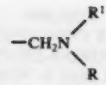
Malcolm J. Thompson, Baltimore; Julius Feldmesser, and William E. Robbins, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 12, 1975, Ser. No. 631,259
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—325 21 Claims

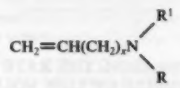
1. A method of controlling plant parasitic nematodes comprising contacting said nematodes with a lethally effective amount of a compound selected from the group consisting of (a) compounds of the formula



wherein A is



R and R^1 are selected from the group consisting of H, CH_3, and C_2H_5, and when x and n are each a number 3, each of R^2, R^3, and R^4 are selected individually from the group consisting of H and CH_3, and when x and n are not each a number 3 and the total of x and n is a number from 3 to 26, R^2, R^3, and R^4 are hydrogen; and (b) compounds of the formula



wherein x is a number from 8 to 30, and R and R^1 are selected individually from the group consisting of H, CH_3, and C_2H_5.

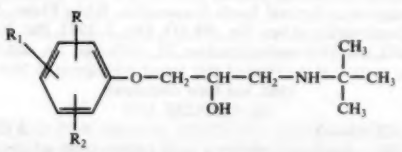
4,036,988

THERAPEUTIC COMPOSITIONS AND METHOD

Herbert Koppe, Ingelheim, Rhine; Albrecht Engelhardt, Mainz, Rhine, and Karl Zeile, Ingelheim, Rhine, all of Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 294,226, Oct. 2, 1972, abandoned, which is a division of Ser. No. 36,676, May 12, 1970, Pat. No. 3,740,444, which is a continuation-in-part of Ser. No. 700,376, Jan. 25, 1968, Pat. No. 3,541,130. This application Feb. 6, 1976, Ser. No. 656,000
Claims priority, application Germany, Feb. 6, 1967, 91070; June 15, 1967, 93025; July 25, 1967, 93645; United Kingdom, June 15, 1967, 27645/67
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 8 Claims

6. A method of producing bradycardia and suppressing tachycardiac effects of N-isopropyl-noradrenaline in warm-blooded animals which comprises administering to warm-blooded animals a safe and effective amount of at least one compound selected from the group consisting of a racemate of 1-phenoxy-3-hydroxy-3-tert.-butylamino propane of the formula



wherein R is $-(CH_2)_x-NH_2$, where x is an integer from 0 to 3, R_1 and R_2 are halogen its optically active isomer and the non-toxic, pharmaceutically acceptable acid addition salt of said racemate and said optically active isomer.

4,036,989

ANTI-INFLAMMATORY COMPOSITION AND METHOD CONTAINING 2-FLUORO-4-ISOPROPYLBIPHENYL

Bernard J. Armitage, and John S. Nicholson, both of Beeston, England, assignors to The Boots Company Limited, England

Filed May 28, 1974, Ser. No. 473,485

Claims priority, application United Kingdom, June 1, 1973, 26276/73

Int. Cl.[2] A61K *31/03; C07C 43/20*

U.S. Cl. 424—353 5 Claims

1. A therapeutic composition useful in the treatment of inflammation comprising an effective anti-inflammatory amount of the compound 2-fluoro-4-isopropylbiphenyl in admixture with a pharmaceutically-acceptable excipient.

4,036,990

METHOD OF INCREASING THE RATE OF SOLUBILITY OF MATERIALS OF LOW SOLUBILITY

Yoshinobu Nakai, Tokyo; Shin'Ichiro Nakajima, Napashino, and Kiyoshi Sugiyama, Chiba, all of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 12, 1975, Ser. No. 557,723

Claims priority, application Japan, Sept. 13, 1974, 49-104898

Int. Cl.[2] A01N *5/00*

U.S. Cl. 424—361 5 Claims

1. The method of increasing the rate of solubility of a material of low solubility comprising mixing the material with beta-1, 4 glucan, and pulverizing the mixture.

4,036,991

SKIN TREATMENT WITH EMOLLIENT CIS-6-HEXADECENOIC ACID OR DERIVATIVES

Werner K. Stiefel, Oak Hill, N.Y., assignor to Stiefel Laboratories, Inc., Oak Hill, N.Y.

Filed Jan. 24, 1972, Ser. No. 220,369

Int. Cl.[2] A61K *7/00, 7/40, 9/06, 31/19*

U.S. Cl. 424—365 4 Claims

1. A method of benefically treating human skin which comprises applying to the skin a composition comprising an admixture of an emollient base with a cosmetic or therapeutic constituent, said base having as its essential emollient constituent at least one lipid substance selected from the group consisting of cis-6-hexadecenoic acid, the mono-, di- and triglycerides of cis-6-hexadecenoic acid, mixed glycerides containing cis-6-hexadecenoic as at least one of the fatty chains, the mono- and di- cis-6-hexadecenoic acid esters of ethylene and propylene glycols, and the cis-6-hexadecenoic acid esters of straight chain and branched chain monohydric alcohols, said lipid constituent comprising from about 3% to about 95% by weight of said composition.

4,036,992

CHEWING GUMS OF LONGER LASTING SWEETNESS AND FLAVOR

Bernard J. Bahoshy, Mahopac; Robert E. Klose, West Nyack, both of N.Y., and Harold A. Nordstrom, Reading, Mass., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 295,313, Oct. 5, 1972, Pat. No. 3,943,258. This application Dec. 29, 1975, Ser. No. 644,707

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.[2] A23G *3/30*

U.S. Cl. 426—3 2 Claims

1. In a sweetened chewing gum composition which comprises gum base, flavor and a major amount of sugar sweetener which imparts normal sweetness to said gum the improvement which comprises at least 0.1% L-aspartyl-L-phenylalanine methyl ester by weight of the total gum composition whereby the normal sweetness and flavor is extended.

4,036,993

PROCESS FOR PREPARATION OF FISH MEAT EXTRACTS

Izumi Ikeda, and Takashi Takasaki, both of Karatsu, Japan, assignors to Tensei Suisan Company, Limited, Karatsu, Japan

Filed Apr. 16, 1976, Ser. No. 677,696

Claims priority, application Japan, Apr. 25, 1975, 50-49597

Int. Cl.[2] A23L *1/325*

U.S. Cl. 426—7 5 Claims

1. A process for preparing fish meat extracts which comprises the steps of forming an aqueous mixture of uncomminuted fish bodies and water, maintaining said aqueous mixture at elevated temperature between about 50° and 60° C. and a pH between 9 and 10, adding to the heated mixture a first proteinase, said first proteinase being stable in alkaline media, maintaining said mixture with said proteinase at said elevated temperature, for a sufficient period of time to effect a first enzymatic reaction wherein proteins are decomposed to the stage or proteoses, adjusting the pH of the reaction mixture from said first enzymatic reaction to between about 5 and about 6, adding thereto a second proteinase, said second proteinase being stable in acidic media, maintaining the resulting mixture containing said second proteinase admixed therewith at elevated temperature between about 50° and about 60° C., for a sufficient period of time to effect a second enzymatic reaction, heating the products of said second enzymatic reaction to about 90° C. to deactivate said proteinases, separating said products into a plurality of layers including an aqueous fish meat extract layer, and recovering said aqueous fish meat extract layer.

4,036,994

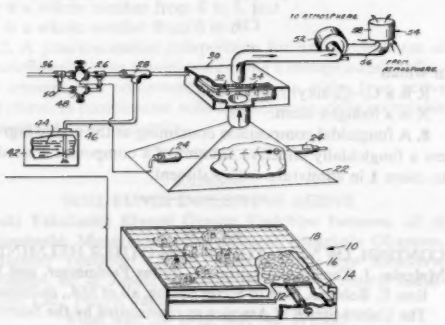
METHOD FOR ABATING ODOR AND SMOKE EMISSIONS IN THE VAPOR EXHAUST FROM A MEAT BROILING GRILL

Frank P. Ear, Nashville, N.C., assignor to H.G.C. Construction & Equipment Company, Inc., Rocky Mount, N.C.

Filed Mar. 21, 1975, Ser. No. 560,593

Int. Cl.[2] A23L *1/31;* A47J *37/06*

U.S. Cl. 426—233 7 Claims



1. In a restaurant meat broiling method for a restaurant having a property line bounding the restaurant, in which method meat slabs are to be supported on a grill and cooked from below by heat radiating from a layer of heat radiating bodies which, in turn, are heated from beneath, typically by a gas burner, and

wherein the rising cooking vapor exhaust stream is collected in a hood which connects with a stack for discharging the cooking vapor exhaust stream to the atmosphere,

a method for abating odor and smoke emissions in the cooking vapor exhaust stream, comprising:

running the grill with the heat radiating bodies at a temperature, at the surfaces thereof which are presented toward the meat patties, between 600° F. and 800° F., in order to

more completely incinerate meat juices which drop from the meat slabs onto the heat radiating bodies; and

spraying into the cooking vapor exhaust stream, after the said stream is collected in the hood but before said stream is discharged to the atmosphere sufficient quanta of oxidizer for the ordorous aldehydes released by char-broiling meat, to render the discharged stream substantially odorless as sensed at the boundary of the restaurant property,

wherein sufficiency of quanta is determined by initially running the grill at various degrees of saturation expected during meat broiling at the restaurant,

for each of several degrees of increasing saturation, adding to the rate of said spraying until, from the boundary of the restaurant property, the discharged stream is sensed as being substantially odorless,

sensing the degree of opacity of the cooking vapor exhaust stream as it enters the hood,

tabulating the spraying rate for achieving substantially odorless discharge at said boundary versus the degree of saturation of the grill for each of said several degrees and ranking the degree of opacity with the corresponding degrees of increasing saturation of the grill, and

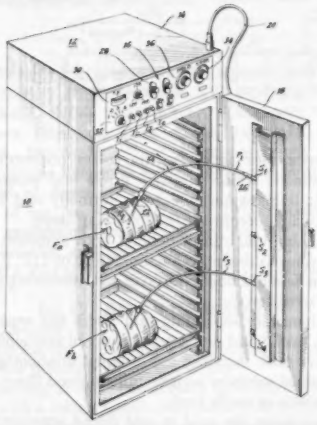
utilizing the tabulation during operation of the grill to select the rate of spraying of oxidizer corresponding to the particular degree of saturation being experienced on the grill and the degree of opacity being experienced as the cooking vapor exhaust stream enters the hood.

4,036,995

OVEN COOKING MONITOR FOR UNIFORMLY COOKING A PLURALITY OF FOOD ITEMS REQUIRING DIFFERENT COOKING TIMES

Bernard G. Koether, and Allan E. Witt, both of Westport, Conn., assignors to Food Automation Service Techniques, Inc., Stratford, Conn.

Filed Dec. 29, 1975, Ser. No. 644,875
Int. Cl.[2] A23L *1/00*; A47J *37/00*
U.S. Cl. 426—233 **12 Claims**



6. An oven cooking method for automatically controlling the cooking, to a selected degree of doneness, of a plurality of food items requiring different cooking times, to permit food items to be loaded into the oven in random order and removed in the order in which the food items become done, comprising:

placing food items into an oven,

inserting a temperature-sensing probe into each food item of a type that provides a signal varying with the temperature sensed by the probe, said temperature sensing probe being connected to said oven,

setting a reference temperature signal to correspond to the desired degree of doneness,

using self-actuating comparison means to compare the sensed temperature signal with the reference temperature signal and to provide an output signal when the sensed and reference signals match, to indicate which probe is associated with the done food items, and to switch the oven to a holding temperature curtailing further cooking of the food items,

removing the done food from the oven and disconnecting the probe for the done food item from the oven, and

in response to the disconnecting of the probe associated with the done food item, said comparison means stopping the indication that a food item is done, and switching the oven again to a cooking temperature to resume cooking of the remaining food items,

whereby cooking of the food items proceeds with each food item attaining the desired degree of doneness with overcooking automatically prevented, and with an indication of the order in which the food items become done and are to be removed.

4,036,996

PROCESS FOR THE PRODUCTION OF AN IMPROVED SIMULATED CASEIN FROM PROTEINACEOUS MIXTURES

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 26, 1976, Ser. No. 680,096
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—254 **13 Claims**

1. A process for producing a proteinaceous mixture of modified plant protein and unmodified protein, said mixture having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

a. making an aqueous slurry of a plant protein material, said plant protein materials containing steam volatile flavor components and at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 18 percent by weight;

b. adjusting the pH of the aqueous slurry to a pH in the range of from about 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

c. reacting the alkali metal carbonate with the plant protein by heating the aqueous slurry to a temperature in the range of from 280° F. to 370° F. for from 2.5 to 5 minutes;

d. cooling the reacted protein slurry to a temperature below 130° F.;

e. adding from 0.3 percent to about 1.5 percent by weight peroxide to the slurry, said peroxide being a member selected from the group consisting of hydrogen peroxide, sodium peroxide, potassium peroxide, calcium peroxide, and magnesium peroxide;

f. mixing the peroxide containing slurry;

g. neutralizing the slurry to a pH within the range of from 6.6 to 7.0 by addition thereto of an edible acid;

h. thereafter, removing the steam volatile flavor components from the slurry by heating the slurry;

i. drying the neutralized slurry to remove a substantial portion of the water therein; and

j. admixing from 1 to 15 parts by weight of the substantially dried neutralized slurry with from 1 to 30 parts by weight proteinaceous material not having been modified by reaction with an alkali metal carbonate.

4,036,997

METHOD FOR FREEZE FORMING MEAT PRODUCTS

David L. VerBurg, 4069 Lila Ave., Grandville, Mich. 49418

Division of Ser. No. 431,678, Jan. 9, 1974, Pat. No. 3,924,295.
This application June 20, 1975, Ser. No. 588,591
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—272 **14 Claims**

1. The method of forming a shaped meat product capable of

withstanding subsequent cooking without loss of geometric integrity comprising the steps of: providing chunks of unground fresh meat; forming a tacky exudate on the surface of the meat without further comminution of the same; packing the meat in a mold to fill it; closing the mold to entirely enclose the meat therein while applying little or no compressive forces to it; gradually expanding the meat in the closed mold by slowly subjecting the mold and the meat contained therein to subfreezing temperatures to generate elevated pressures solely by expansion resulting from freezing and by maintaining a constant volume in the mold allowing the pressure exerted upon the meat to increase to that which is necessary to force the meat to fill any voids within the mold and to press the meat chunks tightly together; thereafter continuing to freeze the meat while maintaining the pressure constant by controlled expansion of the mold volume until the entire contents of the mold is frozen, removing the frozen meat as an integrated body from the mold.

4,036,998

HONEY CONTAINING DESSERT COMPOSITION

John Ruff, Banbury, England, assignor to General Foods Limited, Oxon, England

Filed Jan. 21, 1976, Ser. No. 650,830

Claims priority, application United Kingdom, Jan. 31, 1975, 3739/75

Int. Cl.[2] A23L *1/187*

U.S. Cl. 426—302 **5 Claims**

1. A process for producing a free-flowing powder dessert composition containing real honey which comprises spraying liquid honey globules having an average diameter of less than 300 microns on to an agitating free-flowing powder dessert composition.

4,036,999

TREATMENT OF WHEY

Donald A. Grindstaff, Minnetonka, Minn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 502,262, Aug. 30, 1974, abandoned, which is a continuation of Ser. No. 336,843, Feb. 28, 1973, abandoned. This application Nov. 13, 1975, Ser. No. 631,799

Int. Cl.[2] A23C *21/00*; A21D *2/34*

U.S. Cl. 426—549 **16 Claims**

1. A process for pretreating a raw cheese whey feed containing at least 20% acid cheese whey said percent being by weight based on the total weight of said feed and recovering insoluble solids therefrom which process consists essentially of:

a. adjusting the pH of said raw cheese whey feed to between about 6.5 to about 8.0 by the addition of base, whereby insoluble solids are formed within said raw cheese whey feed;

b. separating said insoluble solids produced by (a) above from said feed and recovering said insoluble solids as sludge; said liquid remaining after said insoluble solids removal also being recovered as a mother liquor; and

c. adding to said insoluble solids obtained by (b) after separation from said feed calcium ion at a concentration between about 0.002 to about 0.010 grams per gram of insoluble solids (dry basis) and heating the mixture to between about 125° F. to 200° F. for at least 1/6 hour.

4,037,000

ICING MIXTURE

Malcolm Leonard Ernest Burge, Thatcham, and Heather Ann Gill, Reading, both of England, assignors to Tate & Lyle Limited, London, England

Filed Oct. 22, 1976, Ser. No. 734,960

Claims priority, application United Kingdom, Oct. 24, 1975, 43749/75

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—572 **21 Claims**

1. An icing composition comprising a mixture of (1) sugar comprising powdered sucrose and (2) an aqueous gel of xanthan gum containing up to 10% dry weight of xanthan gum, said mixture containing at least 82% by weight of sugar, said composition containing from 6.0 to 10.5% by weight of free water and from 0.15 to 0.7% by weight of dry xanthan gum.

4,037,001

SALAD DRESSING

France Flowers, 157 W. 73rd St., New York, N.Y. 10023

Filed Apr. 14, 1976, Ser. No. 677,058

Int. Cl.[2] A23L *1/24*

U.S. Cl. 426—589 **5 Claims**

1. A method of preparing a salad dressing comprising

a. washing, draining, and shredding a portion of a head of raw red cabbage into coarsely-divided cabbage pieces of substantially equal size,

b. adding said cabbage pieces to a mixture of salad dressing ingredients comprising white vinegar, mayonnaise, sugar and salt,

c. agitating said mixture of salad dressing ingredients and cabbage pieces,

d. refrigerating said mixture of salad dressing ingredients and cabbage pieces, and

e. removing the liquid portion of said mixture of salad dressing ingredients and cabbage pieces, thereby providing an edible liquid salad dressing.

4,037,002

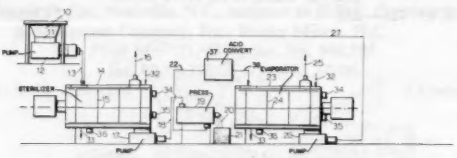
METHOD AND PROCESS FOR TREATING RUMEN CONTENT

Ivan S. Brumagim, 2 Woodlawn Drive, North Warren, Pa. 16365

Continuation-in-part of Ser. No. 384,909, Aug. 2, 1973, abandoned. This application Dec. 31, 1974, Ser. No. 537,833

Int. Cl.[2] A23K *1/08, 1/10*

U.S. Cl. 426—641 **1 Claim**



1. A process for converting the rumen content of a slaughtered ruminant which contains fibers and separable solids, liquids, including water, which are normally acid, into a useful product, which comprises the following steps:

a. sterilizing said rumen content with agitation by heating said rumen content to a temperature of 212° F by indirect steam heat in a steam sterilizer and exhausting vapors from said sterilizer,

b. mechanically separating said fibers and separable solids from said liquid into a solid material containing approximately 50% moisture and a liquid containing about 5% entrained solids by weight, utilizing said fibers and separable solids as cattle feed,

c. neutralizing the acid in said liquid separated from said fibers and separable solids,

d. concentrating said neutralized liquid to entrained solids containing about 75% moisture by evaporating said liquids at a temperature of less than 425° F with agitation, and forming steam,

e. utilizing said steam from Step (d) as steam from a conventional boiler,

f. mechanically separating said entrained solids from said concentrated material or step D into solids containing about 50% moisture content and liquid, utilizing said entrained solids as cattle feed,

g. returning said liquid from said second mechanical separation step to said second mentioned sterilizing step and mixing said liquid with the said rumen content therein.

4,037,003

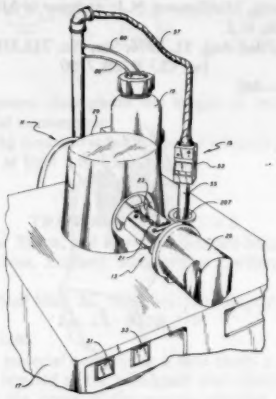
METHOD FOR BLOOD FILM PREPARATION

Francis William Maher, Jr., Milford, and Vladimir Valentine Pirc, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 669,015, March 22, 1976, Pat. No. 4,016,828. This application Jan. 13, 1977, Ser. No. 758,998

Int. Cl.[2] A01N *1/02*; B05C *11/02*; G01N *1/28*

U.S. Cl. 427—2 9 Claims



1. A method of preparing a blood film on a planar substrate comprising the steps of:

depositing a blood specimen on a substrate;

spinning the substrate at a high angular rate about an axis perpendicular to its plane; and

surrounding the substrate with a flowing curtain of liquid positioned to intercept and collect blood particles and aerosols spun off the substrate.

4,037,004

METHOD FOR PRODUCING THERMOPLASTIC RESIN FILMS OR SHEETS FOR CHELATE COLOR PRINTING

Shiro Nakano, Suita; Norio Kanbe, Amagasaki; Tsugumichi Nakagawa, Hirakata; Akira Nishio, Takatsuki, and Kengo Kitahara, Funabashi, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha and Tomoegawa Paper Co., Ltd., both of, Japan

Division of Ser. No. 413,509, Nov. 7, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,727

Claims priority, application Japan, Nov. 9, 1972, 47-112729; Nov. 9, 1972, 47-112730; Nov. 9, 1972, 47-112731; Nov. 9, 1972, 47-112732

Int. Cl.[2] B41M *5/12*; B05D *5/04*

U.S. Cl. 427—145 20 Claims

1. A process for producing a thermoplastic resin film for chelate color printing, which comprises

A. contacting at least one surface of a thermoplastic resin film with a mixed liquid composition comprising:

i. a liquid capable of dissolving or swelling said thermoplastic resin,

ii. a liquid having no ability to dissolve or swell said thermoplastic resin, compatible with said liquid (i) and having a faster rate of evaporation than said liquid (i), said liquid (i) being used in an amount of 1 to 100 parts by weight per 100 parts by weight of the liquid (ii), and (iii)

a. an inorganic compound containing at least one metal atom selected from the group consisting of iron in the trivalent state, vanadium in the tetravalent or pentavalent state, molybdenum in the hexavalent state, titanium in the tetravalent state, and tungsten in the hexavalent state, or

b. an organic compound capable of forming a chelate compound with the metal atom and developing a color, and

B. evaporating off said liquids (i) and (ii), thereby to form a porous layer of said film on the said contacted surface of the film and to simultaneously form on the porous surface of said layer a chelate color printing layer comprising said inorganic or organic compound (iii), said inorganic compound being present in the said mixed liquid in such amounts that it is deposited on the porous surface of the thermoplastic resin film in amounts of 0.2×10^{-4} to 0.1×10^{-1} mol/m^2 and wherein the organic compound is present in the liquid mixture in such amounts that it is deposited on the thermoplastic resin film in amounts of 0.3×10^{-4} to 0.2×10^{-1} mol/m^2.

4,037,005

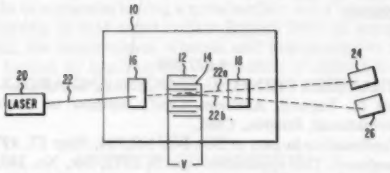
METHOD OF MAKING OPTICAL WAVEGUIDES AND PRODUCT BY THE PROCESS

William Phillips, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 442,844, Feb. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 434,408, Jan. 18, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,725

Int. Cl.[2] B05D *5/06*

U.S. Cl. 427—162 12 Claims



3. The method of making an optical waveguide which comprises:

a. depositing a film of niobium on one surface of a polished single crystal of lithium tantalate,

b. oxidizing the niobium,

c. annealing the crystal at an elevated temperature to allow the niobium to diffuse into the crystal, and

d. cooling to room temperature.

4,037,006

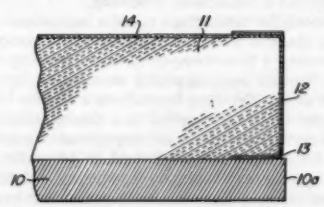
COMPOSITE PANEL-BOARD AND METHOD OF MAKING SAME

Frank William Roberts, 380 E. 7500 S., Midvale, Utah 84047; Richard Allen Roberts, 2551 Milo Way; Waldo Calvin Roberts, 4906 Regency, both of Salt Lake City, Utah 84117, and Robert Howard Blanpied, 519 Barnard, Centerville, Utah 89014

Filed Oct. 12, 1976, Ser. No. 731,369

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—71 15 Claims



1. A composite panel board, comprising a rigid, gypsum

board, base panel having mutually opposite, broad, flat surfaces; a rigid, organic plastic, foam layer formed in-situ on, self-adherant to, and covering one of the broad, flat surfaces of said gypsum board base panel; a visible slot extending along the mutually opposite, side-edge faces of the composite board between the foam layer and the base panel; and a water-vapor-resistant, flame-retardant layer adherant to and covering the otherwise exposed, broad surface of said foam layer.

4,037,007

DOCUMENT AUTHENTIFICATION PAPER

William Albert Wood, Basingstoke, England, assignor to Portals Limited, Basingstoke, England

Filed July 30, 1975, Ser. No. 600,380

Claims priority, application United Kingdom, Aug. 2, 1974, 34276/74

Int. Cl.[2] D21H *5/10*

U.S. Cl. 428—199 **15 Claims**

1. Paper for use in the production of security documents by printing thereon, which paper incorporates planchettes, said planchettes having incorporated therein or applied thereto a substance which is capable of taking part in a color-forming reaction whereby, when a security document produced from said paper is verified by the application of a reagent or reagents, the said substance changes color by the color-forming reaction, and wherein said paper may additionally comprise one or more substances capable of taking part in a color-forming reaction, said substance not being incorporated in said planchettes.

4,037,008

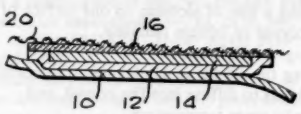
TRANSFER PRINTING PROCESS AND ARTICLE

Dennis H. Tugwell, Anaheim, Calif., assignor to Photo-Lith International, Stanton, Calif.

Continuation-in-part of Ser. No. 143,914, May 17, 1971, abandoned. This application Apr. 3, 1972, Ser. No. 240,371

Int. Cl.[2] B32B *3/00*; B44C *1/16*; D06Q *1/00*

U.S. Cl. 428—200 **9 Claims**



1. A transfer lamination having transfer layers for the application of an image onto fabric substrate, said transfer layers consisting of:

a transparent first layer which forms a tough rubbery film which has a high degree of thermal stability and is resilient to yellowing;

at least one image-carrying layer printed on the back of said first layer by a surface-to-surface printing method; and

an adhesive layer forming the back layer of said transfer lamination for adhesive attachment of said transfer lamination to a resilient substrate said adhesive layer forming a tough rubbery film which has a high degree of thermal stability and is resistent to yellowing.

9. In a process for producing a transfer lamination employed to apply an image to a flexible substrate which comprises the steps of forming a first transparent layer, printing an image layer onto the first layer, applying an adhesive layer to the image layer so that the three layers form a transfer lamination which can be adhesively applied to a flexible substrate, and drying and curing said layers, the improvement wherein:

the first transparent layer is formed on a transfer sheet by applying a layer of transparent polyvinyl chloride plastisol heat resistant thermal elastic stretch ink to a release surface of the transfer sheet and partially curing said layer by infrared heating; the image layer is formed on the first layer so as to be visible through the first layer by lithographically printing heat resistant ink which is compatible with the first layer on to said first layer; and the adhesive layer is formed by applying a polyvinyl chloride plastisol heat resistant thermal elastic stretch ink over the first layer and the image layer; said layers being partially cured such that the first layer and adhesive layers are not tacky at room temperature.

4,037,009

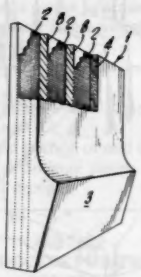
CONDUCTIVE ELASTOMERIC ELEMENTS

John Severinsen, Middletown, N.J., assignor to Metex Corporation, Edison, N.J.

Filed Aug. 11, 1976, Ser. No. 713,331

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—241 **20 Claims**



1. An electromagnetic shielding element comprising an elastomer containing a particulate conductive filler and at least one layer of knitted wire mesh in said elastomer.

4,037,010

ORGANIC COMPOSITES WITH IN-SITU FORMED FIBERS AND EXTENSIBLE MATRIX

Leon Brian Keller, Palos Verdes Estates, and Raymond E. Kelchner, Jr., Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 2, 1976, Ser. No. 711,000

Int. Cl.[2] B32B *5/02, 5/04*

U.S. Cl. 428—290 **8 Claims**

1. A composite material comprising a coherent, three-dimensional network of structurally interconnected polymeric fibers impregnated with an extensible resin matrix having a pliable resilient nature, which exhibits the propensity for increasing strength and toughness with repeated load cycling.

4,037,011

GLASS FIBER REINFORCED THERMOPLASTIC COMPOSITION AND PROCESS FOR ITS PREPARATION

Kiyoshi Hattori; Edward L. Lowery; William H. Chadbourne, and William M. Boyer, all of Evansville, Ind., assignors to Dart Industries Inc., Los Angeles, Calif.

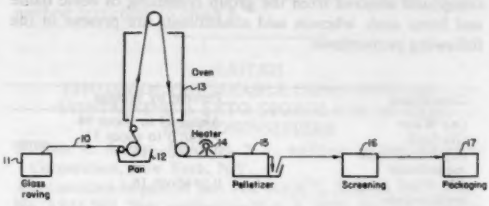
Continuation of Ser. No. 226,418, Feb. 15, 1972, abandoned, which is a division of Ser. No. 48,892, June 15, 1970, abandoned, which is a continuation of Ser. No. 677,969, Sept. 25, 1967, abandoned. This application Feb. 28, 1975, Ser. No. 553,962

Int. Cl.[2] B32B *5/16*; D02G *3/36*; B44D *1/02*; C08F *1/84*

U.S. Cl. 428—294 **13 Claims**

1. A blending concentrate of glass filaments uniformly predisposed in highly oriented relationship in a thermoplastic resin and having the form of generally rod-shaped granules of at least ¼ inch in length said granules being combinable by simple mixing with substantial quantities of unreinforced thermoplastic resin pellets to form dry free-flowing compositions which, on hot molding or shaping, yield superior reinforced articles, said concentrate consisting essentially of about 70 to 90% by weight of glass filaments and about 30 to 10% by weight of a thermoplastic resin chosen from the group consist-

ing of polystyrene, styrene-acrylonitrile copolymer, polyethylene, polypropylene, polycarbonate, polyamide and polyester with a multiplicity of glass filaments extending in essentially



parallel alignment throughout the length of each individual granule of said concentrate.

2. A blending concentrate as in claim 1 wherein said granules are generally at least ¼ inch in length.

4,037,012

TRANSFER MATERIALS

Edward Arthur Tilson, and Raymond Leonard Mayhew, both of Waltham Cross, England, assignors to Caribonum Limited, England

Filed Mar. 16, 1976, Ser. No. 667,523
Int. Cl.² B32B *3/26*
U.S. Cl. 428—304 **8 Claims**

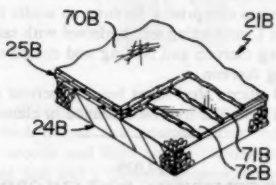
1. Transfer material comprising a base sheet, a layer of porous material bonded to the base sheet and coloured ink contained within the pores of the porous material wherein the porous material comprises a mixture of at least one cellulose ester resin and one or more acrylic resins, the weight ratio of cellulose ester resin to acrylic resin within the range 6:1 to 1:6.

4,037,013

CARPET UNDERLAY COMPRISING FOAMED SCRAP PARTICLES

George R. Sprague, Dyersburg, Tenn., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 7, 1975, Ser. No. 629,745
Int. Cl.² B32B *5/24, 5/30*
U.S. Cl. 428—310 **1 Claim**



1. A carpet underlay having an equal cross-section throughout and consisting of first and second layers, said first lyer comprising bonded scrap particles of flexible elastomeric foam material, said second layer bonded against the entire surface of said first layer free of additional adhesive means between layers, said second layer being defined by a plurality of sheets consisting of a sheet of spunbonded polyester fibers and at least one sheet of polyethylene film, said sheet of polyethylene film disposed adjacent said first layer.

4,037,014

SEMICONDUCTOR ABSORBER FOR PHOTOTHERMAL CONVERTER

Jonathan Isaac Gittleman, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,394
Int. Cl.² F24J *3/02*; F03G *7/02*; B32B *15/16*
U.S. Cl. 428—331 **7 Claims**

1. An absorber for photothermal conversion comprising:
a reflector;
a layer of electrically insulating material on said reflector;
granular semiconductor particles uniformly dispersed in said layer;
said electrically insulating layer having an index of refrac-

tion lower than said semiconductor particles and exhibiting no significant absorption in the infrared radiation region up to about 30 μ; and
said layer also being immiscible with said semiconductor particles.

4,037,015

HEAT INSULATING COATING MATERIAL

Keiichi Koike, Matsudo, and Toshimi Sasaki, Abiko, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 21, 1975, Ser. No. 560,818
Claims priority, application Japan, Mar. 29, 1974, 49-34427; Mar. 29, 1974, 49-34428
Int. Cl.² B28B *7/36*
U.S. Cl. 428—331 **16 Claims**

12. In an apparatus having a metal surface and a heat-protective coating on said metal surface formed from an inorganic material, the improvement wherein said heat-protective coating is formed by applying the composition of claim 1 to said metal surface and allowing said composition to dry.

4,037,016

ADHESIVE COMPOSITION

Bruce W. Habeck, Cuyahoga Falls, and George W. Feeney, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 552,687, March 14, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,736
Int. Cl.² C08K *5/01*; C08L *7/00, 53/02*; C09J *7/02*
U.S. Cl. 428—349 **10 Claims**

1. An adhesive composition prepared by mixing in the presence of a volatile organic solvent selected from at least one of the group consisting of toluene, benzene, pentane, hexane, heptane and octane, as well as unreacted hydrocarbons, (1) about 100 parts by weight of a rubber primarily selected from at least one of a natural rubber and synthetic rubber selected from cis-1,4-polyisoprene, cis-1,4-polybutadiene, butyl rubber, ethylene/propylene/non-conjugated diene rubber, aqueous emulsion copolymerized 1,3-butadiene and styrene, and an unvulcanized elastomeric block copolymer having the general configuration A - B - A wherein each A is an independently selected nonelastomeric styrene polymer block having an average molecular weight of about 2,000 to about 100,000 and a glass transition temperature above about 25° C., the total block A content being from about 10 to about 50 percent by weight of the copolymer, and B is an elastomeric conjugated diene polymer block of a diene selected from 1,3-butadiene and isoprene having an average molecular weight from about 25,000 to about 1,000,000 and a glass transition temperature below about 10° C., said copolymer having a tensile strength at 25° C., in excess of about 200 pounds per square inch, and (2) about 60 to about 140 parts by weight of a compatible, thermoplastic tackifying resin containing carbon-to-carbon unsaturation therein and having a softening point in the range of about 60° C. to about 80° C. and drying the resulting composition, said tackifying resin being prepared by the method which comprises (A) reacting in the presence of an aliphatic hydrocarbon solvent and a catalyst selected from aluminum chloride and ethyl aluminum dichloride, a monomer mixture consisting of 60 to about 75 weight percent of a diolefin/olefin mixture of

a weight ratio in the range of about 0.6/1 to about 1.4/1 and, correspondingly, about 40 to about 25 weight percent α-methyl styrene, where said diolefin consists of at least about 95 weight percent piperylene and up to about 5 weight percent isoprene based on the diolefin, and where said olefin comprises at least one olefin selected from 2-methyl-2-butene, 2-methyl-2-pentene and 2-methyl-1-pentene and (B) recovering the resin from the polymerization mixture by first neutralizing the catalyst with a material selected from water, lime and at least one alcohol selected from methanol, isopropanol and butanol, followed by stream stripping the filtrate thereof to remove volatiles.

4,037,017

ELECTROCONDUCTIVE PAPER

William Walter Maslanka, London-Britain Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 8, 1975, Ser. No. 638,786
Int. Cl.[2] B32B *27/38, 33/00*
U.S. Cl. 428—413 **3 Claims**

1. In a electroconductive paper base sheet comprising a cellulosic web having disposed on at least one surface thereof an electroconductive layer the improvement wherein the electroconductive layer consists essentially of an electroconductive resin consisting essentially of the diquaternary chloride of the reaction product of (1) a water soluble or water dispersible poly(alkyldiallylamine)-epichlorohydrin base resin having epoxide moieties and (2) a tertiary amine having the formula $R_1R_2R_3N$ where R_1 and R_2 and R_3 are the same or different alkyls having from 1 through 9 carbon atoms in an amount at least stoichiometrically equivalent to the epoxide moieties of the base resin.

4,037,018

CATIONIC AQUEOUS COMPOSITIONS OF POLYMER HAVING AMINE GROUPS, ACID NEUTRALIZED, AND ABIS-MALEIMIDE CROSS-LINKER, COATINGS AND PROCESS

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 574,024, May 2, 1975, abandoned, which is a division of Ser. No. 519,409, Oct. 31, 1974, Pat. No. 3,925,181. This application July 2, 1976, Ser. No. 702,340
Int. Cl.[2] C08J *3/06;* **C08K** *5/34*
U.S. Cl. 428—418 **9 Claims**

1. A coating composition in aqueous dispersion for forming a heat-curable film thereof on a substrate, comprising:

a polymer having at least about 5% by weight pendant primary and/or secondary amine groups, said amine groups being protonated with acid to render said polymer water-dis-persible; and

at least about 5% by weight of said polymer of bis-maleimide cross-linking agent,

said bis-maleimide for cross-linking said polymer through said amine groups by addition polymerization to form a heat-cured film on said substrate.

4,037,019

ACIDIC HYDROSOLS AND PROCESS FOR COATING THEREWITH

John F. Steger, Crystal Lake, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Oct. 24, 1975, Ser. No. 625,638
Int. Cl.[2] D02G *15/00*
U.S. Cl. 428—469 **36 Claims**

1. An acidic hydrosol composition consisting essentially of the initial constituents water, an acid selected from the group consisting of phosphoric acid, nitric acid, hydrochloric acid and acetic acid, a metal silicate selected from the group consisting of alkali metal metasilicates having the formula M_2SiO_3, alkali metal orthosilicates having the formula M_4SiO_4, where M is sodium or potassium, and hydrous magnesium silicate, magnesium compound selected from the group consisting of magnesium oxide and magnesium hydroxide, and a boron compound selected from the group consisting of boric oxide and boric acid, wherein said constituents are present in the following proportions:

Constituent	Percent by Weight
(A) Water	About 43 to about 94
(B) Acid	About 3 to about 51
(C) Alkali metal metasilicate	0 to about 16
(D) Alkali metal orthosilicate	0 to about 16
(E) Hydrous magnesium silicate	0 to about 18
(F) Magnesium compound	0 to about 6.6
(G) Boron compound	0 to about 1

wherein:

when (C) is O, then (D) is at least 1% and (F) is at least about 0.5%;

when (D) is O, then (C) is at least 1% and (F) is at least about 0.5%;

when both (C) and (D) are O, then (E) is at least about 0.9%;

when (C) and (E) are each zero, then (D) is at least 1% and (F) is at least 0.5%;

when (D) and (E) are each zero, then (C) is at least 1% and (F) is at least 0.5%;

when (C) is zero, then (D) is greater than zero but less than 1% when (E) is at least 0.9%;

when (D) is zero, then (C) is greater than zero but less than 1% when (E) is at least 0.9%;

the concentration of acid is at least the stoichiometric quantity required to react with either (C), (D) or (E), or with mixtures thereof to form silicic acid; and the ratio of M_2O to SiO_2 is from about 1:1 to about 2:1 in said alkali metal metasilicates and orthosilicates.

11. A process for depositing an electrically insulating and corrosion resistant coating from an acidic hydrosol onto a substrate which consumes a minor quantity of acid from said hydrosol, said substrate being selected from the group consisting of metals higher than hydrogen in the electromotive series, porcelain, glass, wood, paper, cotton, plastics and hydrateable oxides, said process comprising forming an acidic hydrosol as defined in claim **1**, contacting said hydrosol with said substrate to form a coating thereon and heating said coated substrate to dry said coating thereon.

36. A coated silicon steel sheet having thereon an adhered coating formed from the hydrosol defined in claim **1**.

4,037,020

ADHESIVE COMPRISING POST-CHLORINATED POLYETHYLENE AND POLYVINYL CHLORIDE

Ko Ishii, Takatsuki, and Tadamasa Yoshida, Kobe, both of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Division of Ser. No. 428,997, Dec. 27, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 642,959
Claims priority, application Japan, Dec. 27, 1972, 48-129989; Dec. 27, 1972, 48-129990; Dec. 27, 1972, 48-129991; Dec. 27, 1972, 48-129992
Int. Cl.[2] B32B *27/32, 27/30*
U.S. Cl. 428—518 **21 Claims**

1. A method of adhering polyvinyl chloride and an olefinic polymer which comprises co-extruding three layers of a polyvinyl chloride, an adhesive and an olefinic polymer to produce a three-layered laminate of, in order of layers, polyvinyl chloride, adhesive and olefinic polymer, said adhesive comprising

a. 1 to 99% by weight of post-chlorinated polyethylene having a specific gravity of 1.00 to 1.35, a chlorine content of 5 to 50% and a mean molecular weight of from about 20,000 to 200,000, and

b. 99 to 1% by weight of polyvinyl chloride having a mean degree of polymerization of from about 300 to 2,500.

7. A three-layered composite material prepared by the method according to claim 1.

4,037,021

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING A KETO DIOXOLANE AS THE PHOTOSENSITIZER

William R. Adams, Oakland, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 368,677, June 11, 1973, Pat. No. 3,944,509. This application Nov. 4, 1975, Ser. No. 628,836

Int. Cl.² C08F 2/46, 4/00

U.S. Cl. 428—522 **8 Claims**

1. A photopolymerizable composition consisting essentially of about 10–99 parts of (a) an ethylenically unsaturated monomeric ester and about 1–90 parts of (b) a photosensitizer selected from the group consisting of 2-trichloromethyl-4-benzoyl-4-phenyl-1, 3-dioxolane, 2-(p-dimethylaminophenyl)-4-benzoyl-4-phenyl-1,3-dioxolane, 2-cinnamyl-4-benzoyl-4-phenyl-1,3-dioxolane, and 2-furyl-4-benzoyl-4-phenyl-1,3-dioxolane.

4,037,022

FUEL CELL

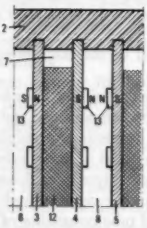
Jacques Cheron, Maisons-Laffitte, France, assignor to Institut Francais du Petrole, France

Filed May 6, 1976, Ser. No. 683,828

Claims priority, application France, May 12, 1975, 75.14941

Int. Cl.² H01M 8/04

U.S. Cl. 429—10 **9 Claims**



1. A fuel cell comprising a sealed block including a plurality of plates which delimit first compartments receiving a liquid electrolyte, second and third compartments receiving respectively a fluid fuel and a fluid comburent, means feeding said block with said liquid electrolyte, fluid fuel and fluid comburent, and means for subjecting at least some of the plates which delimit the compartments to magnetic attractive forces counteracting the action of pressing forces exerted on said plates by fluid contained in the compartments.

4,037,023

FUEL CELLS

Alain Grehier, Paris, and Jacques Chéron, Maisons-Lafitte, both of France, assignors to Institut Francais du Petrole, France

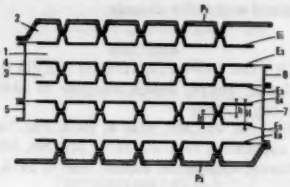
Filed Feb. 12, 1976, Ser. No. 657,535

Claims priority, application France, Feb. 25, 1975, 75.05826

Int. Cl.² H01M 8/00

U.S. Cl. 429—12 **21 Claims**

1. In an improved fuel cell of the type comprising a fuel cell block formed of a stack of electrodes which delimit between each other first compartments containing an electrolyte and second compartments for the circulation of fluid reactants, said second compartments being located at opposite sides of said first compartments, wherein the improvement comprises each of said electrodes being provided, on its face adjacent to said second compartments, with protrusions, the protrusions of one



electrode bear on the protrusions of the adjacent electrode in the stack.

4,037,024

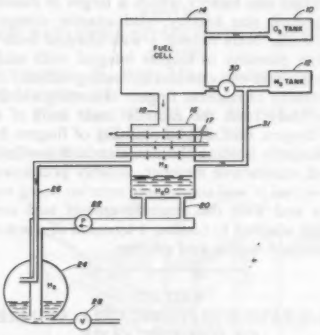
FUEL CELL PRODUCT-WATER MANAGEMENT SYSTEM

Michael B. Landau, West Hartford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1973, Ser. No. 331,133

Int. Cl.² H01M 8/04

U.S. Cl. 429—17 **4 Claims**



1. A product-water management system for a hydrogen-oxygen fuel cell supplied through feed lines with hydrogen and an oxygen-containing gas, said system comprising:

conduit means for removing steam-carrying hydrogen from the fuel cell;

a condenser connected to said conduit means for converting said steam into water;

a water storage tank;

a tansfer line connecting said storage tank to said condenser;

a continuously operating pump mounted in said transfer line; and

a vent line at least partially mounted within said transfer line connected at one end to said water storage tank and at the other end to said condenser for equalizing the pressures in said condenser and said water storage tank.

4,037,025

HALOGEN FUELED ORGANIC ELECTROLYTE FUEL CELL

Arabinda N. Dey, Needham, and Carl R. Schlaikjer, Arlington, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 20, 1972, Ser. No. 299,557

Int. Cl.² H01M 8/00

U.S. Cl. 429—29 **11 Claims**

1. A fuel cell comprising a porous cathode element for introducing a cathodic halogen; a source of halogen for said cath-

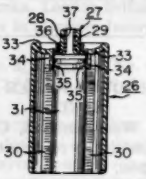
ode; an active metal anode; and an organic electrolyte in contact with said anode and said cathode, said organic electrolyte comprising an anhydrous polar organic liquid solvent having dissolved therein an anhydrous inorganic halide salt of said active metal and sulfur dioxide.

4,037,026

ADAPTER FOR NON-STANDARD SIZED BATTERY

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Division of Ser. No. 467,305, May 6, 1974, Pat. No. 3,998,516. This application Dec. 31, 1975, Ser. No. 645,625
Claims priority, application Japan, May 6, 1974, 49-467305
Int. Cl.[2] H01M *2/10*
U.S. Cl. 429—100 **6 Claims**



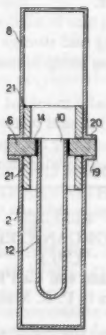
1. An adapter to enable a non-standard sized battery to be operatively placed into a battery compartment designed to house a standard size battery which is larger in diameter than said non-standard size battery, said adapter comprising an elongated, tubular body having a wall integral with one end thereof, a first plurality of fingers integral with said tubular body proximate said one end and extending radially inwardly, a second plurality of resilient fingers extending axially within said tubular body from the radially inner ends of said first plurality of fingers, said second plurality of fingers defining a bore for releasably holding the non-standard size battery and an elongated, conductive member, slidably positioned in said bore with one end of said conductive member being external of said adapter and with the opposite end of said conductive member being adapted to contact a terminal of a non-standard battery positioned within said adapter.

4,037,027

SODIUM-SULPHUR ELECTRIC CELL AND METHOD OF FORMING SAME

Gerard Desplanches, Villejust; Yvon Lazennec, St. Michel sur Orge, and Alain Wicker, Limours, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Nov. 4, 1976, Ser. No. 738,981
Claims priority, application France, Nov. 28, 1975, 75.36558
Int. Cl.[2] H01M *10/36, 10/38*
U.S. Cl. 429—104 **17 Claims**



1. A method of producing a sodium-sulphur type electric cell, said cell comprising:

a cathode tank for containing a cathode reagent which is liquid at operation temperature and is a material selected from the group consisting of sulphur, phosphorus, selenium and alkaline salts of these substances;

at least one solid electrolyte tube closed at its bottom end, for containing an anode reagent which is liquid at operation temperature, said tube consisting of an alkaline metal and being disposed in said cathode tank so as to be immersed in said cathode reagent, the walls of said tube being made of beta sodium alumina;

a support of an insulating ceramics substance for holding said electrolyte tube in said cathode tank, a glass part connecting said support to said tube;

an anode tank for containing a store of said anode reagent and being disposed above said cathode tank, so that said electrolyte tube opens at its top into said anode tank, said support separating the open ends of said anode tank and of said cathode tank;

said method comprising:

first, forming the connection between said electrolyte tube and said support of an insulating ceramics substance;

and successively disposing said tanks on either side of said support with flanges provided at their open ends and with said tanks substantially concentric with said electrolyte tube;

inserting an O ring respectively between the flanges of the tanks and said ceramics support;

heating the assembly to a temperature close to but lower than the melting point of the material constituting said O rings while maintaining compressive pressure on said flanges;

cooling the assembly down to ambient temperature; and

disposing at least one bushing previously in contact with at least the bottom part of the wall of each of said tanks with said bushings bearing on respective faces of said insulating ceramics support prior to heating said assembly.

11. An electric cell of the sodium-sulphur type, said cell comprising:

a cathode tank for containing a cathode reagent which is liquid at operation temperature and is a material selected from the group consisting of sulphur, phosphorus, selenium and alkaline salts of these substances;

at least one solid electrolyte tube closed at its bottom end for containing an anode reagent which is liquid at operation temperature, said tube consisting of an alkaline metal and being disposed in said cathode tank so as to be immersed in said cathode reagent, the walls of said tube being made of beta sodium alumina;

a support of an insulating ceramics substance for holding said electrolyte tube in said cathode tank,

a glass part connecting said support to said tube,

an anode tank for containing a store of said anode reagent and being disposed above said cathode tank so that said electrolyte tube opens at its top into said anode tank, said support separating the open ends of said anode tank and said cathode tank,

said tanks being initially disposed on either side of said support and including flanges provided at their open ends substantially concentric with said electrolyte tube with an O ring inserted respectively between the flanges of the tanks and said ceramic support, and said tanks being joined to said support by heating the assembly to a temperature close to but lower than the melting point of the material constituting said O rings while maintaining compressive pressure on said flanges and cooling said assembly, and

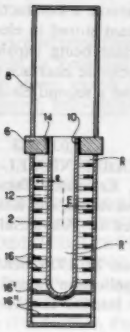
at least one bushing disposed in contact with said at least the internal bottom part of the wall of each of said tanks with said bushings bearing on respective faces of said insulating ceramic support prior to heating said assembly.

4,037,028

SODIUM-SULPHUR TYPE ELECTRIC CELL

Alain Le Méhauté, Gif sur Yvette, and Philippe Bordet, Sartrouville, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Nov. 4, 1976, Ser. No. 738,995
Claims priority, application France, Nov. 20, 1975, 75.35469
Int. Cl.[2] H01M 10/36
U.S. Cl. 429—104 2 Claims



1. An electric cell of the sodiumsulphur type, comprising:

a cathode tank containing a cathode reagent which is liquid at operation temperature and is selected from the group consisting of sulphur, phosphorus, selenium and the alkaline salts of these subsstances,

at least one solid electrolyte tube closed at its bottom end, containing an anode reagent which is liquid at operation temperature and constituted by an alkaline metal, said tube being disposed in said cathode tank so as to be immersed in said cathode reagent, said walls of the tube being made of beta alkaline alumina;

an insulating ceramic support for holding said electrolyte tube in said cathode tank, a glass part forming a connection between said support and said tube;

an anode tank containing a supply of said anode reagent and disposed above said cathode tank with said electrolyte tube opening at its top into said anode tank, said support separating the open ends of said anode tank and of said cathode tank, said cathode tank being fitted with a plurality of washers made of graphite felt for ensuring cathode collection of the generated current with the edges of some of the washers facing the lateral wall of said electrolyte tube being disposed at a predetermined distance from the tube and having at least one other washer bearing against the bottom of said electrolyte tube.

4,037,029

PHOTOELECTROGENERATIVE CELL

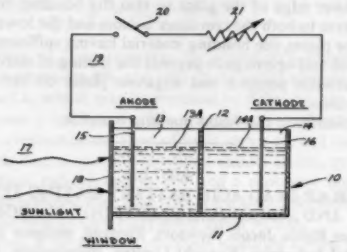
John Harland Anderson, 12920 Nicollet Ave., Burnsville, Minn. 55337

Filed July 16, 1975, Ser. No. 596,352
Int. Cl.[2] H01M 6/30, 6/36
U.S. Cl. 429—111 12 Claims

1. Photoelectrogenerative cell means comprising, in combination, cell means including an anode cell and a cathode cell for retaining an anolyte and catholyte respectively, cell isolation means physically separating and ionically coupling said anolyte and said catholyte; means providing for the transmission of solar radiation into said anolyte;

a. said anode cell containing an anolyte comprising an electrolyte in aqueous solution and a particulate photosensitive electrogenerative solid substantially insoluble in said anolyte solution in admixture with said anolyte therein, an anode immersed in said anolyte, said anode being effectively electrolytically inert to said anolyte and to said photosensitive electrogenerative material;

b. said cathode cell containing a catholyte consisting essentially of an electrolyte in aqueous solution and a cathode immersed in said catholyte, said cathode being effectively electrolytically inert to said catholyte; and



c. said cell isolation means comprising electrolytically permeable means electrolytically coupling the respective solutions of said anolyte cell and said catholyte cell.

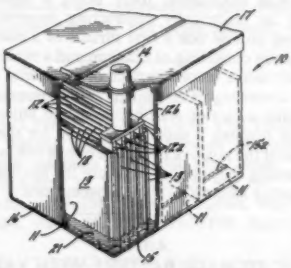
4. The photoelectrogenerative cell means as defined in claim 1 being particularly characterized in that said photosensitive electrogenerative material is an enzyme.

4,037,030

STORAGE BATTERY AND METHOD OF FORMING THE SAME

Anthony Sabatino, St. Paul, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1975, Ser. No. 563,840
Int. Cl.[2] H01M 2/18
U.S. Cl. 429—139 8 Claims



1. A storage battery comprising the combination of

a. a plurality of alternately positive and negative plates disposed within an electrolyte in a battery container, said plates resting on the bottom of said container,

b. a battery separator material in the form of envelopes around at least alternate plates with each envelope being sealed along at least the lower portions of the vertical edges of the plate and at least partially open along the lower edge of the plate to form bottom openings to permit access of a bonding material to the lower edge of the plate, and

c. a bonding material adhered to both the bottom wall of the battery container and the lower edges of the plates and extending through the bottom openings formed by said envelopes, said bonding material also sealing said bottom openings to prevent the treeing of active material between positive and negative plates at the bottom of the container.

5. A method of forming a storage battery comprising the steps of

a. forming a layer of liquid bonding material on the bottom of a battery container,

b. placing a plurality of alternately positive and negative

plates within said container with the plates resting on the container bottom and with a battery separator material in the form of envelopes around at least alternate plates with each envelope being sealed along at least the lower portions of the vertical edges of the plate and at least partially open along the lower edge of the plate to form bottom openings to permit access of the bonding material to the lower edge of the plate so that the bonding material adheres to both the container bottom and the lower edges of the plates, the bonding material having sufficient depth to seal said openings to prevent the treeing of active material between positive and negative plates on the container bottom, and

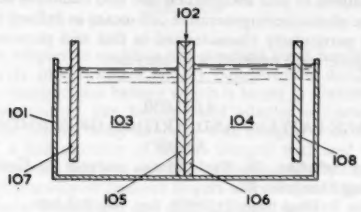
c. solidifying the liquid bonding material.

4,037,031

BIPOLAR LEAD ACID BATTERY HAVING TITANIUM AND ZIRCONIUM ELECTRODE SUPPORTS

William Robin Jacob, Newport, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed June 3, 1975, Ser. No. 583,273
Int. Cl.[2] H01M *10/18*
U.S. Cl. 429—149 **29 Claims**



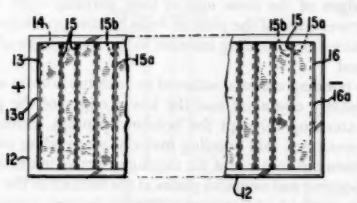
1. A lead acid battery including at least two cells containing sulphuric acid electrolyte, there being a bipolar electrode comprising an electrically conducting impervious sheet of metal having on one side a first surface of a material selected from the group consisting of titanium and a titanium alloy, and on the other side a second surface of a material selected from the group consisting of zirconium and a zirconium alloy, the sheet forming a barrier wall between two adjacent cells, the first surface forming a support structure for the lead dioxide active mass of the positive electrode of one cell, and the second surface forming the support structure for the lead active mass of the negative electrode of the adjacent cell.

4,037,032

ELECTRIC STORAGE BATTERY WITH VALVE METAL ELECTRODES

Antonio Nidola, Milan, Italy; Vittorio de Nora, Nassau, Bahamas, and Placido M. Spaziante, Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed May 5, 1976, Ser. No. 683,544
Int. Cl.[2] H01M *6/16*
U.S. Cl. 429—198 **28 Claims**



1. An electric storage battery comprising a casing, a cover, an aqueous bromide electrolyte containing a bromine sequestering agent, and at least one pair of a cathode and anode, the said cathode being a titanium base having an electrical conducting, electrocatalytic oxide coating thereon containing oxides of a metal selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof and mixed oxides of at least one of said metals and at least one film forming metal.

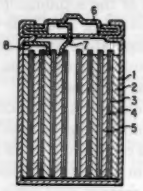
24. An electric battery capable of generating a persistant battery voltage and current, said battery including an electrolyte and a titanium electrode comprising an electroconductive substrate having thereon a conductive oxide of a platinum group metal, a reactant stored in electrical contact with said electrode, said reactant being capable of reacting with the electrolyte at the electrode interface to produce ions and promote current flow and a second electrode.

4,037,033

RECHARGEABLE NICKEL-ZINC BATTERY

Tsutomu Takamura, Kawasaki; Tamotsu Shirogami, Yamato; Hirokazu Niki, Yokohama, and Kazuo Aizawa, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co. Ltd., Kawasaki, Japan

Filed Jan. 20, 1976, Ser. No. 650,782
Claims priority, application Japan, Jan. 20, 1975, 50-8440
Int. Cl.[2] H01M *6/04*
U.S. Cl. 429—206 **11 Claims**



1. A rechargeable nickel-zinc battery comprising in combination:

a. a negative electrode prepared by adhering to a current collector sheet, a mixture comprising a fluorine containing resin and a powder which contains 3 to 20 wt. % of at least one member selected from the group consisting of calcium oxide and calcium hydroxide, 1 to 20 wt. % of at least one member selected from the group consisting of bismuth oxide, bismuth hydroxide, cadmium oxide and cadmium hydroxide; the balance being zinc and at least one member selected from the group consisting of zinc oxide and zinc hydroxide, with said sheet structure of fluorine containing resin;

b. a positive electrode having hydrated nickel oxide as the active material and having a theoretical capacity of one-quarter to one half times the theoretical capacity of said negative electrode;

c. a separator which is place between said negative and positive electrodes;

d. a quantity of concentrated alkaline electrolyte of from 1.0 to 1.7 ml per one ampere hour of the theoretical capacity of said negative electrode.

4,037,034

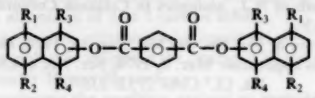
PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING A DINAPHTHYLPHTHALATE

Don A. Plank, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 562,579, March 27, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,685
Int. Cl.[2] C08J *3/20*
U.S. Cl. 526—5 **9 Claims**

1. A plastic composition containing polyolefin having incor-

porated therein an effective amount of an accelerating agent which is a dinaphthylphthalate compound having the formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen; a straight or branched chain alkyl group having from 1 to 6 carbon atoms; cyano; nitro; lower alkoxy; fluorine; dialkylamino; phenyl; halo-phenyl; benzyl; or halo-benzyl.

4,037,035

HYDROPHILIC MODIFIED ACRYLIC POLYMERS PARTICULARLY HYDRODISPERSIBLE OR HYDROSOLUBLE MODIFIED ACRYLIC POLYMERS AND METHOD OF PREPARING THE SAME

Jean-Henri Blanc, Pau; Rene Pornin, Arthez-de-Bearn, and Robert Voirin, Mourenx, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed July 23, 1975, Ser. No. 598,185

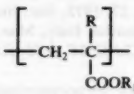
Claims priority, application France, July 26, 1974, 74.26010

Int. Cl.[2] C08F *8/32, 220/06, 220/14, 220/18*

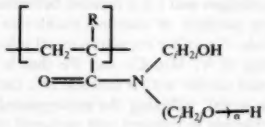
U.S. Cl. 526—16 **29 Claims**

1. modified acrylic polymers dispersible or soluble in water, comprising expressed in mole %:

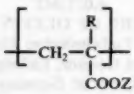
p % units A having the formula:



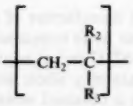
q units B having the formula:



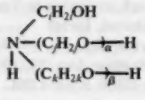
r % units C having the formula:



and *s* % units D having the formula:

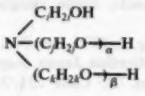


wherein each R designates hydrogen, and methyl or ethyl radicals, R_1 designates hydrogen or an alkyl radical with 1 to 4 carbons, Z designates at least one alkali metal, alkaline earth metal or quaternary ammonium radicals having the formula:



the proportion of Z representing the quaternary ammonium radicals being between 0% and 10% of the entire amount of Z, while *i, j* and *k*, which may be identical or different, are comprised between 1 and 6, and while α and β are equal to 0 or 1, whereas R_2 represents one atom of hydrogen a methyl radical, R_3 represents one or more monovalent amido, amino, pyridyl or pyrrolidinyl radical, and *p, q, r* and *s* represent integers which are so selected that $5 \leqq p \leqq 99$, $2 \leqq q \leqq 80$, $5 \leqq r \leqq 80$, and $0 \leqq s \leqq 40$, the sum $(p+q+r+s)$ being equal to 100.

7. A method of preparing hydrophile modified acrylic polymers according to claim **1**, comprising the steps of reacting between 50–150° C. an acrylic polymer which is derived from one or more monomers producing units A, with at least one alkanolamine having the formula:



wherein *i, j, k* represent numbers comprised between 1 and 6, and wherein α and β, which may identical or different, are equal to 0 or 1, then submitting the product resulting from the aforesaid reaction to alkaline hydrolysis by treating the same with an aqueous alkaline solution of an alkali metal or alkaline earth metal compound, and separating the thus obtained modified acrylic polymer from the hydrolysis medium.

4,037,036

9-(p-VINYLPHENYL)-ACRIDINE POLYMERS

Akio Mukoh; Yasuki Mori, and Hirosada Morishita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 23, 1975, Ser. No. 580,316

Claims priority, application United Kingdom, May 24, 1974, 49-57876; Japan, June 28, 1974, 49-73375; July 10, 1974, 49-78238

Int. Cl.[2] C08F *26/06*

U.S. Cl. 526—46 **6 Claims**

1. A homopolymer for use in a photoconductive material of 9-(p-vinylphenyl)acridine.

3. A copolymer for use in a photoconductive material consisting of a polymer produced by copolymerizing at least 50 mole % of 9-(p-vinylphenyl)acridine and at least one monomer selected from the group consisting of styrene, acrylonitrile, an acrylate, a methacrylate, N-vinylcarbazole, 9-vinylanthracene, 9-vinylacridine, 9-(p-vinylphenyl)-anthracene and vinylacetate.

5. A process for producing a polymer of 9-(p-vinylphenyl)acridine which comprises heating 9-(p-vinylphenyl)acridine alone or together with another polymerizable vinyl monomer selected from the group consisting of styrene, acrylonitrile, an acrylate, a methacrylate, N-vinylcarbazole, 9-vinylanthracene, 9-vinylacridine, 9-(p-vinylphenyl)-anthracene and vinylacetate in the presence of a free radical initiator or an ionic catalyst.

6. A process for producing a polymer of 9-(p-vinylphenyl)acridine which comprises reacting a p-halogenated styrene polymer with a 9-alkali metal-substituted acridine or reacting a p-alkali metal-substituted styrene polymer with a p-halogenated acridine.

4,037,037

NOVEL METHOD OF ORGANIC SYNTHESIS TO FORM A POLYMER-BOUND ACTIVE SPECIES

Avraham Patchornik, Ness-Ziona, and Menahem A. Kraus, Rehovot, both of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 167,022, July 28, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,583
Int. Cl.[2] C08C *19/12;* C08F *8/18;* C08C *19/00;* C08F *210/00*
U.S. Cl. 526—46 3 Claims

1. A method of forming a stable enolate in an inert solvent which comprises covalently bonding a plurality of linking groups to an insoluble cross-linked polymer, covalently bonding an enolizable compound to at least one of said linking groups so as to provide at least one side chain of the enolizable compound covalently bound to the polymer network, and reacting the enolizable compound bound polymer with an enolizing agent in the presence of an inert solvent to provide at least one enolate covalently bound to the polymer network.

4,037,038

RESINS FOR USE AS COATING MATERIAL AND PROCESS FOR PREPARING SAME

Shozo Tsuchiya, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 711,047
Claims priority, application Japan, Aug. 5, 1975, 50-94693
Int. Cl.[2] C08F *236/22*
U.S. Cl. 526—56 9 Claims

1. Resins suitable for use as a coating material, consisting essentially of an esterified copolymer of (1) a copolymer of (i) at least one cyclopentadiene compound selected from the group consisting of cyclopentadiene, dicyclopentadiene, tricyclopentadiene, tetracyclopentadiene and lower alkyl substitution products thereof wherein the lower alkyl has 1–3 carbon atoms and (ii) at least one α, β-unsaturated monomer selected from the group consisting of hydroxyalkyl acrylate, hydroxyalkyl methacrylate, glycidyl acrylate, glycidyl methacrylate, allyl glycidyl ether and methallyl glycidyl ether and (2) at least one of acrylic and methacrylic acids.

4,037,039

PROCESS FOR CONTINUOUS XANTHATION AND PRODUCTION OF VISCOSE SPINNING SOLUTION

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Inc., Berwyn, Pa.

Filed Sept. 4, 1975, Ser. No. 610,419
Int. Cl.[2] C08B *9/04*
U.S. Cl. 536—60 7 Claims

1. In a process for xanthating alkali cellulose by contacting said alkali cellulose with carbon disulfide, the improvement consisting of continuously feeding alkali cellulose at a predetermined rate first in dry form to a vessel where it is brought into contact for 3–20 minutes with 5–35% of the CS_2 necessary to provide partial xanthation of the cellulose and then, prior to completion of reaction between said CS_2 and said dry cellulose, passing said cellulose on to a vessel containing an alkali hydroxide slurry, immersing said cellulose therein while continuously introducing carbon disulfide into said vessel at a controlled rate, continuously feeding alkali hydroxide solution into said vessel at a controlled rate, and continuously withdrawing a portion of said slurry from the bottom of said vessel at a rate, selected to maintain a preselected minimum residence time of alkali cellulose in said vessel, then passing said withdrawn slurry through a screw extruder mixer, introducing further carbon disulfide and alkali hydroxide solution thereto, as required, to effect further xanthation therein.

4,037,040

REFLUXING WATER-IN-OIL EMULSION PROCESS FOR PREPARING WATER-SOLUBLE POLYELECTROLYTE PARTICLES

Louis E. Trapasso, Watchung, and Charles V. Juelke, Bellemead, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 497,354, Aug. 14, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,852
Int. Cl.[2] C08F *2/32, 236/00*
U.S. Cl. 526—88 12 Claims

1. An inverse emulsion polymerization process for the production of finely divided, water-soluble polymeric particles which comprises heating to reflux under vigorous agitation of from about 200 to about 700 rotations per minute a water-in-oil-inverse emulsion of a surfactant, a free radical initiator, at least one water soluble, oil-insoluble ethylenically unsaturated monomer adapted to polymerize under refluxing conditions, oil, and water wherein the percent by weight of oil is higher than the percent by weight of water, said oil and water being adapted to form an azeotropic boiling mixture, to cause said monomer to polymerize within aqueous droplets dispersed in the emulsion to form finely divided particles and to cause water to be simultaneously separated therefrom, and recovering finely divided water-soluble polymeric particles.

4,037,041

PROCESS FOR THE POLYMERIZATION OF ALPHA-OLEFINS, CATALYST EMPLOYED IN SUCH A PROCESS AND METHOD FOR THE PREPARATION THEREOF

Sebastiano Cesca, San Donato Milanese; Alberto Greco, Dresano; Guglielmo Bertolini, Pavia, and Mario Bruzzone, San Donato Milanese, all of Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Filed Mar. 27, 1975, Ser. No. 562,800
Claims priority, application Italy, Mar. 28, 1974, 49831/74
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—97 7 Claims

6. A catalyst system for the polymerization of an alpha olefin consisting of a carrier having a high superficial area selected from the oxides of neodymium, lanthanum and cerium, an aluminum compound represented by the formula AlR_3 or AlR_xY_{3-x}, wherein R is an alkyl, aryl or cycloalkyl radical, Y is a halogen or hydrogen and x is a number between 1 and 2, and the combination product of titanium trichloride and an isostructural chloride of another transition metal selected from the group consisting of V, Mn, Co and Fe that is prepared by impregnating said carrier with a solution of a carbonyl of said other transition metal, refluxing the impregnated carrier with titanium tetrachloride to convert said carbonyl into the chloride of said other transition metal and then removing excess titanium tetrachloride.

4,037,042

MANUFACTURE OF OLEFIN POLYMERS

Heinz Mueller-Tamm, Ludwigshafen; Hans Frielingsdorf, Bad Duerkheim; Leonhard Gonsior, Ludwigshafen, and Wolfgang Gruber, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 2, 1976, Ser. No. 720,249
Claims priority, application Germany, Sept. 10, 1975, 2540278
Int. Cl.[2] C08F *4/02, 4/24, 10/00, 10/02*
U.S. Cl. 526—106 7 Claims

1. A process for the manufacture of an olefin polymer by polymerization of one or more α-monoolefins of 2 to 8 carbon atoms at from 60° to 160° C and at an olefin pressure of from 0.5 to 40 bars, by means of a silicic acid xerogel/chromium trioxide catalyst which is obtained when

1. a finely divided silicic acid xerogel is first manufactured by

(1.1) employing a silicic acid hydrogel containing from 10

to 25 percent by weight of solids (calculated as silicon dioxide),

(1.2) extracting at least 60% of the water contained in the hydrogel from the latter by means of an organic liquid selected from the alkanols of 1 to 4 carbon atoms and the alkanones of 3 to 5 carbon atoms,

(1.3) drying the resulting dehydrated gel until there is no further loss in weight in the course of 30 minutes at 180° C under 10 mm Hg and

(1.4) reducing the resulting xerogel to particles having a diameter of from 20 to 2,000 μm,

2. this xerogel is then charged with chromium from a solution, of from 0.05 to 5 percent strength by weight, of chromium trioxide in an alkanone of 3 to 5 carbon atoms or from a solution, of from 0.05 to 15 percent strength by weight, of a chromium compound which under the conditions of stage (3) is converted to chromium trioxide, in an alkanol of 1 to 4 carbon atoms - the solvent in each case not containing more than 20 percent by weight of water - whilst evaporating the solvent, and

3. the resulting product is finally kept at from 400° to 1,100° C for from 10 to 1,000 minutes in an anhydrous stream of gas containing oxygen in a concentration of more than 10 percent by volume,

in which process a catalyst is employed which is manufactured under such conditions that in stage (1) the starting material is a silicic acid hydrogel (1.1) which is substantially spherical, has a particle diameter of from 1 to 8 mm and is obtained by

A. introducing a solution of sodium waterglass or potassium waterglass both longitudinally and tangentially into a vortical stream of an aqueous inorganic acid,

B. spraying droplets of the resulting silicic acid hydrosol into a gaseous medium,

C. allowing the sprayed hydrosol to solidify to a hydrogel in the gaseous medium and

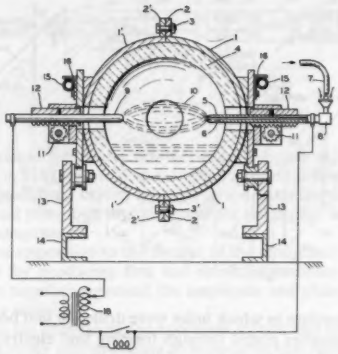
D. freeing the resulting substantially spherical hydrogel from salts by washing, without prior aging.

4,037,043

EXTENDED ARC FURNACE AND PROCESS FOR MELTING PARTICULATE CHARGE THEREIN

Robert Sidney Segsworth, Toronto, Canada, assignor to Tibur Metals, Ltd., Toronto, Canada

Filed June 2, 1975, Ser. No. 580,838
Claims priority, application Canada, Apr. 16, 1975, 224742
Int. Cl.[2] H05H *1/00*
U.S. Cl. 13—9 R **8 Claims**



1. A furnace adapted for the heat treatment of metallic or other material comprising

1. a refractory-interlined vessel having one or more openings adapted to receive one or more electrodes extending into the interior of said vessel, a hearth therein adapted to receive said metallic material, an exit for the escape of gas, and a means for removing molten metal;
2. one or more electrodes, at least one of which has an axial opening extending through at least a major portion of the length of said electrode and communicating with the interior of said vessel, said axial opening having a size predetermined to create a stabilized extended arc according to the flow rate and linear velocity of gas flowing through said opening;
3. a means for supplying a selected gas to the axial opening in said electrode or electrodes whereby to feed said gas into the interior of said vessel; and
4. a power supply connected to said electrode adapted to supply sufficient power to produce an extended arc between said electrode and one or more other electrodes or between said electrode and a charge of metallic material in said hearth and modulating said power by controlling the rate of gas flow and/or the gas composition to stabilize the said extended arc.

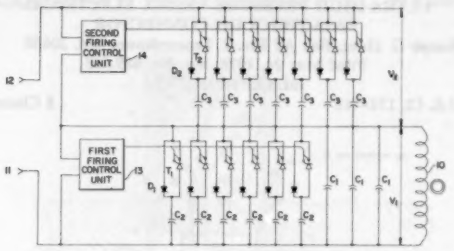
4,037,044

POWER CONTROL SYSTEM FOR SINGLE PHASE INDUCTION MELTING OR HEATING FURNACE

George Havas, Youngstown, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed Aug. 4, 1975, Ser. No. 601,644
Int. Cl.[2] H05B *1/02, 5/04*
U.S. Cl. 13—26 **5 Claims**

1. Power control means for a single phase induction melting or heating furnace for operation from a normal line frequency power supply, one line of said power supply being connected to the first terminal of said furnace, said power control means comprising capacitance and a first group of sets of series connected capacitance and semiconductor means all connected in parallel with said furnace and a second group of sets of series connected capacitance and semiconductor means connected in parallel and interposed between another line in said power supply and the second terminal of said furnace, each said semiconductor means within each set of said first and second group comprising diode rectifier means connected to conduct current only in one direction and controlled rectifier means connected in parallel therewith to conduct current only in an opposite direction, said controlled rectifier means of said first group being actuated by a first firing control means adapted to control the transition of each such controlled rectifier means from the non-conducting to the conducting state, the number and size of sets conducting within said first group determining the total amount of capacitance connected in parallel with said furnace and the phase angle between the furnace voltage and the voltage across said second group of sets thereby setting the



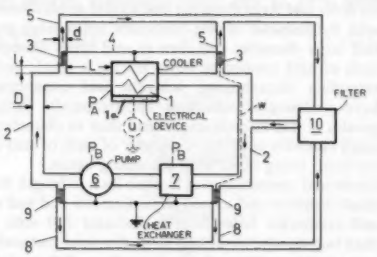
range of voltage and power available to said furnace, said controlled rectifier means of said second group being actuated by a second firing control means adapted to control the transition of each such controlled rectifier means from the non-conducting to the conducting state, the number and size of sets conducting within said second group determining the total amount of capacitance effectively interposed between said other power supply line and said second furnace terminal, thereby controlling the voltage and power delivered to said furnace within the selected range as set by said phase angle.

4,037,045

APPARATUS FOR COOLING ELECTRICAL DEVICES

Conrad Beriger, Aarau, and Reinhard Müller, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 17, 1975, Ser. No. 632,679
Claims priority, application Switzerland, Dec. 6, 1974, 16216/74
Int. Cl.[2] H01G *3/03*
U.S. Cl. 174—15 R **20 Claims**



1. An arrangement of at least one electrical device and an apparatus for cooling said at least one electrical device by means of a flowing cooling medium, comprising means including main conduit means defining a main recirculation cooling system for a cooling medium flowing in a predetermined direction through the main conduit means, means defining a branch circulation system including branch conduits branching-off from the main recirculation cooling system and through which flows a portion of the cooling medium, said at least one electrical device to be cooled coacting with the main recirculation cooling system, said electrical device being at a first potential, said means defining the main recirculation cooling system

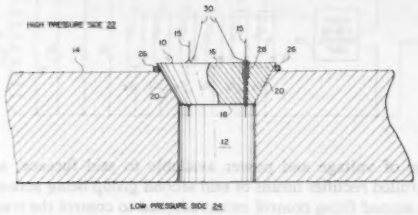
including means for bringing about heat transfer at the cooling medium and being at a second potential, auxiliary electrodes arranged upstream and downstream of the electrical device to be cooled with respect to the predetermined direction of flow of the cooling medium through the main recirculation cooling system, said auxiliary electrodes being located at least partially in the branch conduits which branch-off from the main recirculation cooling system.

4,037,046

ULTRA-HIGH PRESSURE VESSEL ELECTRICAL PASS-THROUGH CONNECTOR

Joseph G. Hoeg, Box A2 Rte. 2, Leonardtown, Md. 20650

Filed May 24, 1976, Ser. No. 689,428
Int. Cl.[2] H01B *17/26*
U.S. Cl. 174—18 **8 Claims**



1. An electrical pass-through connector for passing conductors through a vessel hole extending from the high pressure side to the low pressure side of a vessel, said vessel hole having a tapered counterbore on said high pressure side, said connector being capable of developing a seal against pressures from said high pressure side of said vessel up to 150,000 PSI, comprising:

a small diameter end inserted into said vessel hole from said high pressure side whereby said small diameter end faces said low pressure side;

a large diameter end extending out of said vessel hole facing said high pressure side;

tapered side walls tapering between said large and small diameter ends, said taper reciprocally matching said tapered counterbore of said vessel hole whereby said connector will be in reciprocally mating contact with the walls of said tapered counterbore,

one or more connector holes extending through said connector from said large diameter end to said small diameter end with the diameter of said connector holes being greater at said large diameter end than at said small diameter end, each of said connector holes having a single conductor extending therethrough wherein said connector holes have a diameter which is approximately three times greater at said large diameter end than its diameter at said small diameter end, the remainder of each of said connector holes being filled with a bonding agent;

wherein said connector is at least an inch in length from said small diameter end to said large diameter end and wherein said connector holes have a diameter 100 mils. greater than said conductor at said large diameter end and 20 mils greater than said conductor at said small diameter end.

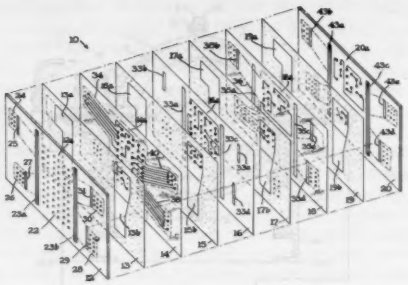
4,037,047

MULTILAYER CIRCUIT BOARD WITH INTEGRAL FLEXIBLE APPENDAGES

Glen J. Taylor, Winter Park, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Dec. 31, 1974, Ser. No. 537,714
Int. Cl.[2] H05K *1/14, 3/30*
U.S. Cl. 174—68.5 **12 Claims**

1. As an article of manufacture, a multilayer printed circuit board having an integral flexible web type conductor appendage comprising at least one flexible circuit-containing layer having at least one flexible appendage, a pair of rigid layers aligned in a predetermined manner with said at least one flexible layer and having electrical connections to the circuits on said at least one flexible layer, said rigid layers being bonded to the opposite sides of said at least one flexible layer in all areas except in locations in which said flexible appendage is located, said rigid layers being substantially oversize and holding said flexible appendage substantially rigid during the manufacturing procedure in which holes were drilled in said bonded array and thereafter plated through forming said electrical connections, said rigid layers being slotted at the location representing the beginning of said at least one flexible appendage and generally overlying the flexible circuit-containing layer, to enable the liberation of such flexible appendage subsequent to the plating operation by the utilization of a cutting device moved around the periphery of such appendage.

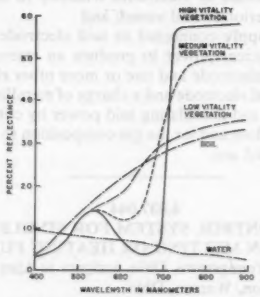


4,037,048

PROCESS FOR THE INTERPRETATION OF REMOTELY SENSED DATA

John E. Walker, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Apr. 19, 1973, Ser. No. 351,414
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—113 **10 Claims**



1. A process for the interpretation of remotely sensed data including the steps of:

sensing data in a plurality of wave bands by means of remote sensors;

adjusting the sensed data to correct for non-linearity of the remote sensors;

dividing an adjusted signal at a first selected one of the plurality of wave bands by an adjusted signal at a second selected one of the plurality of wave bands;

thresholding a signal representing the result of the division;

displaying the thresholded signal; and

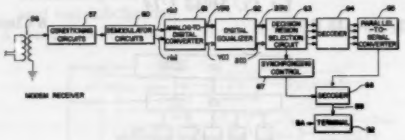
comparing the displayed signal with original data and interpreting the differences.

4,037,049

MODULATOR AND DEMODULATOR FOR DATA COMMUNICATIONS NETWORK

David L. Lyon, Cambridge, Mass., assignor to Intertel, Inc., Burlington, Mass.

Filed Oct. 18, 1974, Ser. No. 515,878
Int. Cl.[2] H04L 27/18
U.S. Cl. 178—67 11 Claims



1. A modem for connection between a digital unit and a transmission link, said modem including a receiver for demodulating a modulated carrier signal received from the transmission link and providing digital signals for the digital unit, said receiver comprising:

A. means responsive to the receipt of the modulated carrier signal for producing first and second coordinate signals which together represent the amplitude and phase of the carrier signal,

B. means for comparing the coordinte signals and predetermined levels corresponding to boundaries that define both rectangular and non-rectangular decision regions, each of the boundaries being parallel to one of the axes in a single Cartesian coordinate system thereby to select one decision region, each decision region having a digital value, and

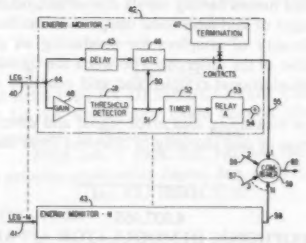
C. means responsive to the digital value of the selected decision region for transmitting the digital signals.

4,037,050

FAULT ISOLATION IN COMMUNICATIONS CIRCUITS

Michael Lefkowitz, Lakewood, and Michael Gordon Taylor, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1976, Ser. No. 690,018
Int. Cl.[2] H04L 1/00
U.S. Cl. 178—69 G 6 Claims



1. In a bridge circuit connecting a plurality of remote communications terminals to a common communications facility extending to a central processing terminal, means for monitoring the energy levels of signals originating at each remote terminal comprising means for detecting an energy level in excess of one or more threshold energy levels,

gating means responsive to the detection by said detecting means of an energy level exceeding one of said threshold levels for cutting through said remote terminal to said comunications facility,

timing means responsive to the detection by said detecting means of an energy level exceeding one of said threshold levels for measuring the persistence of continuous energy from a remote terminal beyond a preselected time duration to generate a time-out signal, and

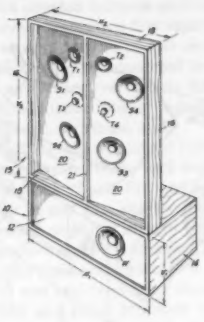
means responsive to the time-out signal from said timing means for blocking the further transmission of signal energy to said communications facility.

4,037,051

FLAT BAFFLE SPEAKER SYSTEM HAVING IMPROVED CROSSOVER

John A. Fuselier, 4309 Oak Walk N., Cumming, Ga. 30130

Filed Jan. 26, 1976, Ser. No. 652,289
Int. Cl.[2] H04R 1/22
U.S. Cl. 179—1 E 11 Claims



1. The method of balancing frequency crossover of an audio speaker system having a flat baffle squaker and a woofer, said method comprising the steps of

a. determining the effective baffle diameter of the flat baffle squaker;

b. determining the impedance of the woofer; and

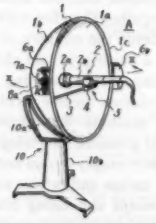
c. providing the woofer with series circuit inductance proportional to the product of the determined effective baffle diameter and woofer impedance.

4,037,052

SOUND PICKUP ASSEMBLY

Toshitada Doi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 13, 1976, Ser. No. 704,841
Claims priority, application Japan, July 22, 1975, 50-89498
Int. Cl.[2] H04R 1/00
U.S. Cl. 179—1 MF 12 Claims



1. A sound pickup assembly comprising:

a. a parabolic sound reflecting member having an open edge;

b. means for attaching a first sound pickup microphone near the focus of said reflecting member;

c. dummy external ears mounted to said reflecting member adjacent edge on the side opposite said first microphone; and

d. means for supporting second and third left and right sound pickup microphones near said dummy external ears.

4,037,053

AUTOMATIC TELEPHONE ANSWERING APPARATUS

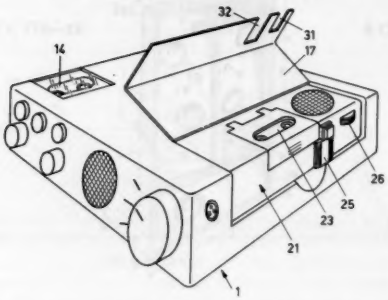
Willy Müeller, Zollikon, Switzerland, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Aug. 15, 1975, Ser. No. 605,039

Claims priority, application Switzerland, Aug. 23, 1974, 11555/74

Int. Cl.[2] H04M *1/64*

U.S. Cl. 179—6 R 6 Claims



1. In combination (1) a portable dictating machine having a first housing, first magnetic tape cartridge receiving means in said first housing, a combination microphone and speaker mounted in said first housing for recording and playing back information on a magnetic tape cartridge in said first receiving means therefor, manually operable control means on said first housing movable between first and second positions for effecting a recording function in said first position and a playback function in said second position, auxiliary microphone connection means and auxiliary power receiving connection means mounted on said first housing and (2) a telephone answering apparatus having a second housing, a second magnetic tape cartridge receiving means in said second housing, microphone receiving socket means on said second housing and second manually operable control means for effecting a recording and a playback of information on a magnetic tape cartridge in said second receiving means, chamber means in said second housing and a closure member therefor, said chamber means having a dimension to receive the entirety of said dictating machine therein and effect a closing of said closure member, said closure member having means defining an opening therein to receive when said closure member is closed said control means on said dictating machine therein only when said control means is in said first position, said telephone answering apparatus including a power supply in said second housing and microphone connection means and power supply connection means in said chamber means and being coupled to the respective ones of said auxiliary microphone connection means and auxiliary power receiving connection means on said dictating machine when said dictating machine is received in said chamber means, said telephone answering apparatus having call detecting means for detecting an incoming telephone call on a telephone line and first switch means for effecting a playback of information on said second magnetic tape to the incoming caller and second switch means responsive to the end of the playback information only when said closure member is closed for effecting a recording of information from the incoming caller on said first magnetic tape.

4,037,054

CIRCUIT ARRANGEMENT FOR MONITORING PCM COUPLERS

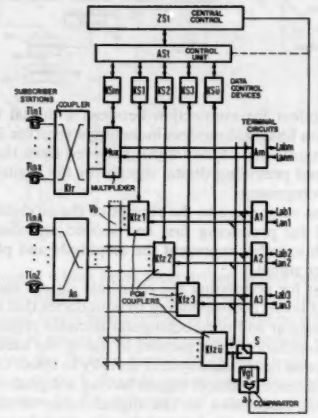
Karlheinz Neufang, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 464,859, April 29, 1974, abandoned, which is a continuation of Ser. No. 218,990, Jan. 19, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 552,000

Claims priority, application Germany, Jan. 19, 1971, 2102371

Int. Cl.[2] H04J *3/14*

U.S. Cl. 179—15 BF 6 Claims



1. In an exchange installation of a telecommunication system which operates according to pulse modulation (PCM) techniques, said exchange having a plurality of PCM couplers to which are assigned incoming and outgoing transmission lines for the exchange, said PCM couplers being interconnected such that signals can be interchanged between couplers, a circuit arrangement for monitoring said plurality of couplers comprising:

at least one additional PCM coupler having inputs connected to the inputs to said plurality of couplers,

comparator means having inputs connected, respectively, to the output of said additional coupler and to the outputs of the plurality of couplers for producing an error signal indicative of the differences between the signals produced by said additional coupler and said plurality of couplers and

means for measuring said error signal and determining the condition of said plurality of couplers from said measurement.

4,037,055

STEREOPHONIC DEMODULATOR APPARATUS

Teruo Sato, Yamato, and Hideo Nakamura, Komae, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 641,026

Claims priority, application Japan, Dec. 16, 1974, 49-144211

Int. Cl.[2] H04H *5/00*

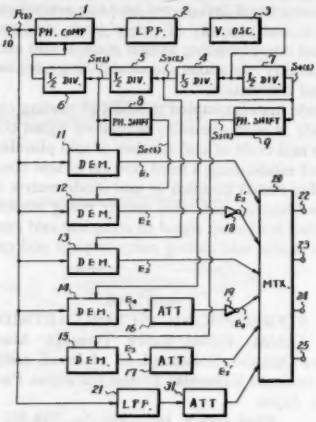
U.S. Cl. 179—15 BT 7 Claims

1. In a stereophonic demodulator system which demodulates a stereophonic composite signal of the type formed of a main channel including at least two audio information signals, at least one subchannel including a subcarrier of predetermined frequency modulated by said at least two audio information signals, and a pilot subcarrier, and wherein said stereophonic composite signal is susceptible to deterioration due to an accompanying useless signal having a carrier related to said subcarrier of predetermined frequency, apparatus for demodulating said stereophonic composite signal and simultaneously cancelling said useless signal, comprising:

local carrier generating means for generating a first switching carrier whose frequency is equal to said predetermined frequency and a second switching carrier whose frequency is an integral multiple of said predetermined frequency and substantially equal to the frequency of the carrier of said useless signal;

a first demodulating circuit for receiving said stereophonic composite signal and said first switching carrier for demodulating said stereophonic composite signal to produce said one subchannel;

a second demodulating circuit for receiving said stereophonic composite signal and said second switching carrier for demodulating said stereophonic composite signal to produce said useless signal;



separating means for receiving said stereophonic composite signal and separating said main channel therefrom;

and means coupled to said first and second demodulating circuits and said separating means to combine said useless signal with said one subchannel for cancelling a useless signal component produced by said first demodulating circuit and accompanying said one subchannel and for extracting said two audio information signals from said main channel and said one subchannel.

4,037,056

FM MULTIPLEX DEMODULATOR CIRCUIT

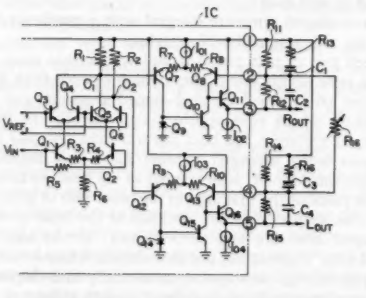
Masanori Ienaka, Fuchu, and Yukio Suzuki, Hinode, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 6, 1976, Ser. No. 646,756

Claims priority, application Japan, Jan. 6, 1975, 50-108

Int. Cl.[2] H04H *5/00*

U.S. Cl. 179—15 BT **6 Claims**



1. An FM multiplex demodulator circuit comprising:

an integrated circuit including:

a first terminal to which a power supply voltage is applied,

a second terminal to which a reference voltage is applied,

third, fourth, fifth and sixth terminals,

a double balance type synchronous detection circuit coupled between said first and second terminals, and having first input to which a subcarrier signal is applied, a second input to which a stereo composite signal is applied, and first and second outputs from which respective channel detection outputs are obtained, first and second load elements being respectively connected between said first and second outputs of said detection circuit and said first terminal, and

first and second negative feedback type differential amplifier circuits coupled between said first and second terminals, having respective first inputs connected to the first and second outputs of said detection circuits, respective second inputs connected to said fifth and sixth terminals and respective outputs for deriving first and second demodulated output signals coupled to said third and fourth terminals; and

a pair of feedback circuits connected between said third and fourth terminals respectively and said first terminal for providing feedback of said first and second demodulated output signals to said first and second negative feedback type differential amplifier circuits respectively, and including respective series circuits each of which comprises first and second resistors connected in series between said first terminal and said respective third and fourth terminals, said fifth and sixth terminals being connected to respective junctures between said first and second resistors in said series circuits.

4,037,057

NOISE-CANCELLING APPARATUS FOR FM STEREO RECEIVER

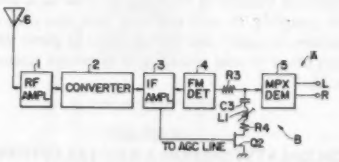
Minoru Ogita, and Juro Hoshi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed July 28, 1975, Ser. No. 599,351

Claims priority, application Japan, Aug. 1, 1974, 49-92146[U]; Oct. 24, 1974, 49-127846[U]; **Oct. 25, 1974, 49-123115**

Int. Cl.[2] H04H *5/00*

U.S. Cl. 179—15 BT **1 Claim**



1. A noise-cancelling apparatus for use in an FM stereo receiver having an intermediate frequency amplifier circuit, an FM detector and a multiplex demodulator, said apparatus comprising:

a filter inserted between said FM detector and said multiplex demodulator, and a switching element connected to the filter, said filter including:

a. a resistor connected in series with a signal line between the FM detector and said multiplex demodulator, and

b. a capacitor and an inductance connected in series with said switching element between the signal line and ground, the series connection of the capacitor and the inductance having a resonance frequency substantially equal to a sub-carrier signal frequency; and said switching element including: a field effect transistor having a gate electrode, said electrode being connected to an automatic

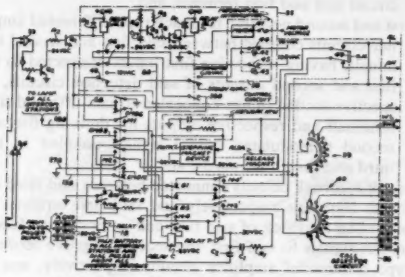
gain control signal line of said intermediate frequency amplifier circuit.

4,037,058

INTERCOM SYSTEM FOR A KEY TELEPHONE SYSTEM

Robert David Stine, Etters, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 6, 1976, Ser. No. 683,877
Int. Cl.[2] H04M *9/06*
U.S. Cl. 179—99 **11 Claims**



1. An intercom system having a plurality of intercom stations comprising:

first means to provide a plurality of interrupted ringing signal bursts when one of said plurality of intercom stations goes off-hook and first initiates a call to another of said plurality of intercom stations;

second means coupled to said first means and said plurality of intercom stations to provide a connection between said one of said plurality of intercom stations and said another of said plurality of intercom stations, said interrupted ringing signal bursts being conducted on said connection to said another of said intercom stations; and

third means coupled to said first means and said plurality of intercom stations to stop said interrupted ringing signal bursts when said another of said plurality of intercom stations goes off-hook;

said first means further providing an interrupted voltage for coupling to said other of said plurality of intercom stations to cause a button lamp at said other of said plurality of intercom stations to flash and to provide a steady voltage for coupling to said other of said plurality of intercom stations to cause said button lamp to glow steadily when said other of said plurality of intercom stations goes off-hook.

4,037,059

INTERCOM SYSTEM FOR A KEY TELEPHONE SYSTEM

Robert David Stine, Etters, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 7, 1976, Ser. No. 684,205
Int. Cl.[2] H04M *9/00*
U.S. Cl. 179—99 **8 Claims**

1. An intercom system having a plurality of intercom stations comprising:

first means coupled to said plurality of stations responsive to a call initiating signal from one of said plurality of stations to establish a connection between said one of said plurality of stations to another of said plurality of stations, said call initiating signal being a code identifying said another of said plurality of stations; and

second means coupled to said plurality of stations and said first means to enable a calling party in the vicinity of said one of said stations to page a called party in the vicinity of said another of said stations through said connection;

said first means being responsive to a predetermined code of said call initiating signal to connect all of said plurality of stations together to enable said calling party to page said called party at all of said plurality of stations;

said first means including

a call selector circuit coupled to said plurality of stations responsive to said call initiating signal to select a first output lead from a first plurality of output leads and to provide a plurality of control signals, said first output lead corresponding to said code of said another of said plurality of stations and establishing a first portion of said connection,

a call routing circuit coupled to said call selector circuit responsive to said plurality of said control signals to connect said first output lead to a second output lead of a second plurality of output leads, said second output lead corresponding to said code of said another of said plurality of stations and establishing a second portion of said connection;

a diode matrix coupled to said call routing circuit to provide at least one relay activating signal corresponding to said code of said another of said plurality of stations and establishing a third portion of said connection; and

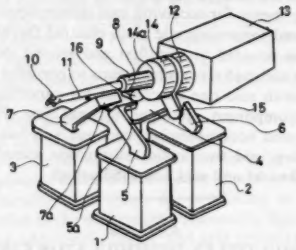
a relay matrix coupled to said diode matrix and said second means, said relay matrix being responsive to said relay activating signal to complete said connection and to enable said calling party to page said called party.

4,037,060

STEREOPHONIC PICKUP CARTRIDGE

Ryuichi Uchida, Fussa; Kaoru Terasaki, Musashino, and Masaru Ogikubo, Kokubunji, all of Japan, assignors to Nippon Atsudenki Kabushiki Kaisha t/a Japan Piezo Co., Ltd., Tokyo, Japan

Filed July 9, 1975, Ser. No. 594,302
Int. Cl.[2] H04R *11/12*
U.S. Cl. 179—100.41 K **8 Claims**



1. A pick-up cartridge comprising:

A. first and second pairs of coils, each pair of coils being electrically connected in series,

B. each pair of coils being respectively coupled to a pair of pole pieces including pole pieces of respectively first and second types, each pole piece having base portions coupled to said coils.

C. a rod-shaped armature integral with a cantilever having its tip end equipped with a stylus,

D. each pair of pole pieces including one pole piece of the first type having one portion which extends from its associated coil toward the rod-shaped armature and a bent portion which runs approximately parallel to the rod-shaped armature, the bent portion from one pair of pole pieces being arranged symmetrically and displaced by approximately 90° with respect to the bent portion of the pole piece of the first type in the other pair of pole pieces,

E. a disk-shaped armature installed at the base of the rod-shaped armature and perpendicular to the axis of the rod-shaped armature, the disk-shaped armature including a pair of lugs arranged symmetrically and displaced by approximately 90° with respect to each other,

F. each pole piece of the second type being situated at a short distance from a respective lug, and

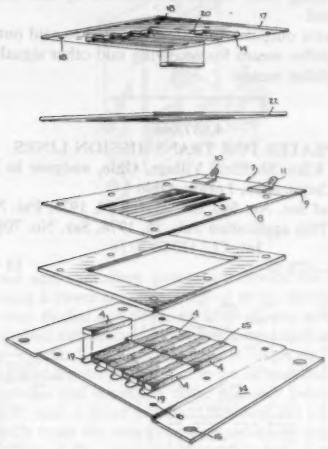
G. support means for supporting the armatures so that the rod-shaped armature moves toward and away from the bent portions of the pole pieces of the first type while never coming between the two pole pieces of any pair and so that the lugs of the disk-shaped armature move toward and away from the pole pieces of the second type.

4,037,061

PLANAR PATTERN VOICE COIL AUDIO TRANSDUCER

Daniel R. von Recklinghausen, Arlington, Mass., assignor to Electro Audio Dynamics, Inc., Great Neck, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,484
Int. Cl.² H04R 9/00
U.S. Cl. 179—115.5 PV 2 Claims



1. An improved audio transducer comprising the combination of:

a flexible plastic diaphragm;

a planar electrical conductor positioned on a surface of said diaphragm having spaced parallel portions;

a magnetic array comprising a row of magnets positioned on and spaced from opposite surfaces of said diaphragm with the magnets of said rows being parallel to one another and to said diaphragm and to said conductor;

the polarity of adjacent magnets being arranged to form a fringing magnetic field at said parallel portions of said conductor;

plate-like iron backing members positioned on each side of said diaphragm and each having elongated slots for mounting and for positioning said rows of magnets;

rigid frame-like spacer means attached to the opposite edges of said diaphragm;

an additional rigid frame-like spacer member positioned between each of said backing members and said first named spacer means with each one having a thickness corresponding generally to the thickness of the adjacent rows of magnets for positively determining the relative positions of said magnets and said diaphragm;

said spacer means further comprising planar conductors coupled to said first named conductors on said diaphragm and positioned between said first named spacer means and one of said additional frame-like spacer members;

one of said iron backing members being imperforate and the other of said iron backing members including perforations for providing an improved high frequency response; and

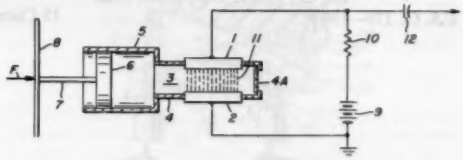
damping material positioned between the rows of magnets at the imperforate backing member.

4,037,062

LIQUID CRYSTAL ELECTROMECHANICAL TRANSDUCER

James L. Fergason, 5806 Horning Road, Kent, Ohio 44240

Filed Aug. 19, 1976, Ser. No. 715,707
Int. Cl.² H04R 23/00; H02N 11/00
U.S. Cl. 179—133 6 Claims



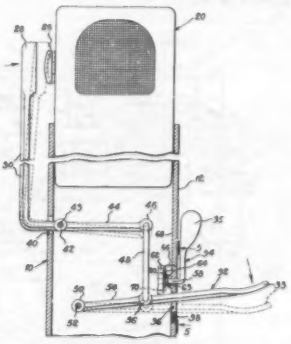
1. In a device for converting mechanical movement into an electrical signal, the combination of a layer of nematic liquid crystal material disposed between spaced conductive plates, the nematic liquid crystal material being such that the long axes of its molecules will be substantially normal to the plates with a potential applied across the plates, means for causing said liquid crystal material to flow essentially parallel to the plates in response to mechanical motion, and means coupled to said plates for sensing a change in capacitance between the plates when the liquid crystal material flows therebetween and the long axes of the molecules are deflected from positions normal to the plates.

4,037,063

MICROPHONE HOLDER ASSEMBLY

Gregory McDonald, 21 Columbus Ave., Hillsdale, N.J. 07642

Filed Nov. 2, 1976, Ser. No. 737,943
Int. Cl.² H04M 1/04
U.S. Cl. 179—147 8 Claims



1. A holder for a microphone which comprises:

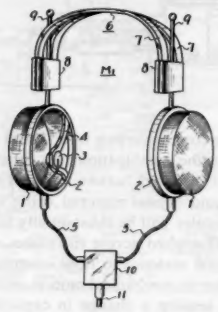
a. an upright portion, said upright portion having a cutout section at the top thereof, said cutout section shaped to accommodate the dimensions of said microphone and to hold the microphone therein; and

b. activating lever means pivotally connected to said upright portion, said activating means coacting with a switch on said microphone after pivoting in response to the physical urging of the operator to thereby turn the switch on, and thus allow voice transmission via the microphone.

4,037,064
STEREO MICROPHONE APPARATUS

Hiroshi Yasuda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,453
Claims priority, application Japan, Oct. 31, 1974, 49-125871; Nov. 1, 1974, 49-126311
Int. Cl.[2] H04M *1/05;* H04R *5/00*
U.S. Cl. 179—156 R 15 Claims

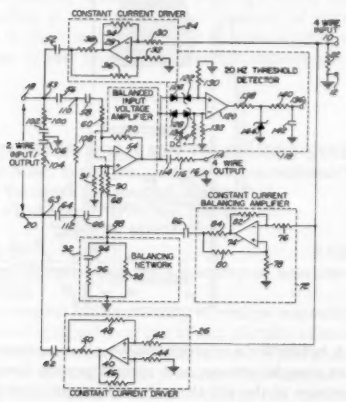


1. A stereo microphone apparatus comprising:
a. a pair of microphone units;
b. windscreens covering each of said microphone units;
c. means for supporting said microphone units within said windscreens, respectively; and
d. resilient means for connecting said windscreens a predetermined distance apart.

4,037,065
20 Hz RINGDOWN SOLID STATE TWO-WIRE/FOUR-WIRE CONVERTER

Lawrence P. Nahay, Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,508
Int. Cl.[2] H04B *1/58*
U.S. Cl. 179—170 NC 4 Claims

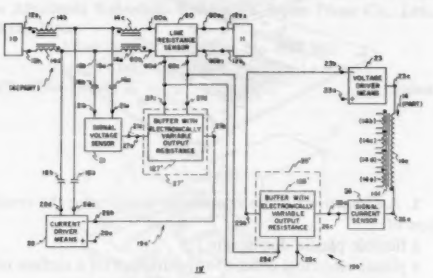


1. A 20 Hz ringdown solid state two-wire/four-wire converter system comprising:
four-wire input terminals, four-wire output terminals and a pair of two-wire input/output terminals;
an inverting solid state constant current driver and a non-inverting solid state constant current driver, said drivers in combination connected to transmit and balance a signal from said four-wire input terminals to said two-wire input/output terminals;
balancing means for use in inhibiting signals from said four-wire input terminals from appearing at said four-wire output terminals, said balancing means connected to said four-wire input terminals;
amplifier means connected at its input to said inverting constant current driver, said non-inverting constant current driver, said balancing means and said pair of two-wire input/output terminals for transmitting signals originating in the converter system at said two-wire input/output terminals and for inhibiting signals originating in the converter system at said four-wire input terminals;
threshold detector means connected to the output of said amplifier means for conducting 20 Hz ringdown signals and rejecting other signals transmitted by said amplifier means; and
said four-wire output terminals connected to said output of said amplifier means for receiving said other signals from said amplifier means.

4,037,066
REPEATER FOR TRANSMISSION LINES

Frederick J. Kiko, Sheffield Village, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Division of Ser. No. 560,258, March 20, 1975, Pat. No. 3,989,906. This application July 26, 1976, Ser. No. 708,989
Int. Cl.[2] H04B *3/16*
U.S. Cl. 179—170 G 13 Claims



1. In an apparatus for modifying the transmission characteristics of a telephone transmission line, the combination of:
shunt impedance simulating means for generating an impedance simulating current which varies in accordance with the signal voltage across the transmission line;
series impedance simulating means for generating an impedance simulating voltage which varies in accordance with the signal current through the transmission line;
means for applying a signal which varies in accordance with the signal voltage across the transmission line to the shunt impedance simulating means;
means for applying a signal which varies in accordance with the signal current through the transmission line to the series impedance simulating means;
means for applying the impedance simulating current in shunt with the transmission line;
means for applying the impedance simulating voltage in series with the transmission line;
control signal generating means for generating a control signal which varies in accordance with the a-c losses of the transmission line;
the shunt impedance simulating means including first control signal responsive means connected to the control signal generating means, the first signal responsive means exhibiting a controllable impedance which varies the impedance simulating current in accordance with the control signal; and
the series impedance simulating means including second

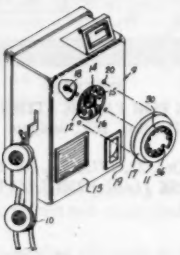
control signal responsive means connected to the control signal generating means, the second signal responsive means exhibiting a controllable impedance which varies the impedance simulating voltage in accordance with the control signal.

4,037,067

ANTI-VANDALISM PROTECTIVE ATTACHMENT DEVICE FOR A PAY TELEPHONE

Yancu Solomovitz B., Casa Numero 61-17 1st Avenue, Caracas, Venezuela

Filed Dec. 24, 1975, Ser. No. 644,330
Int. Cl.[2] H04R *1/02;* **H04M** *1/26*
U.S. Cl. 179—184 **14 Claims**



11. An anti-vandalism protective device for a telephone comprising a cover member adapted to be attached to a telephone over its dial said cover member having a front opening, a disc shaped substitute dial rotatably mounted on said cover member in a position to be exposed through and protectively bridging said front opening and to be substantially parallel to the telephone dial when the cover member is attached to the telephone, and a drive element mounted on and projecting rearwardly from the substitute dial and being engageable in a number hole of the telephone dial when the cover member is attached to the telephone.

4,037,068

TWO-STAGE ROCKER SWITCH FOR CONTROLLING A FLUORESCENT LAMP CIRCUIT

Edwin S. Gaynor, 688 Hulls Farm Road, Southport, Conn. 06490

Continuation of Ser. No. 614,168, Sept. 17, 1975, abandoned.
This application Nov. 17, 1976, Ser. No. 742,704
Int. Cl.[2] H01H *21/00, 1/26, 3/20, 23/26*
U.S. Cl. 200—5 F **10 Claims**

1. A rocker switch assembly comprising:

an open top housing;

a core fitted within the housing for mounting at least one pair of switch contacts;

a pair of normally closed switch contacts located near one end of the core, said pair of normally closed contacts including

a fixed contact positioned in vertically spaced relation to the top surface at the one end of the core,

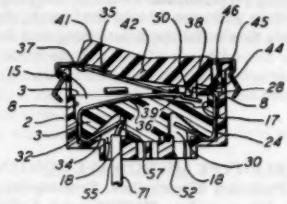
a movable contact positioned between the fixed contact and the top surface of the core, and

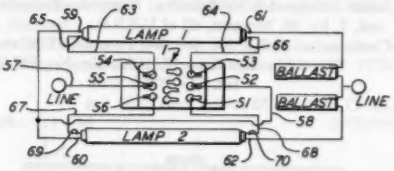
spring biasing means for urging the movable contact upward toward the fixed contact;

a rocker button positioned in the opening of the housing above the core, the rocker button having a protuberance extending from the end of the button corresponding to the one end of the core;

a metal spring catch mounted in the housing for interfering engagement with the protuberance on the rocker button; and

means for supporting the rocker button for limited vertical and pivotal motion about a transverse axis at approximately its midpoint, said means restraining the button against movement in a direction parallel to the top of the housing transverse to the pivot axis, the rocker button acting to depress the movable contact in opposition to the spring biasing means out of conductive contact with the fixed contact when pivoted toward the one end of the





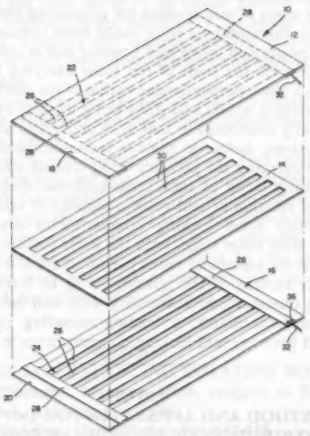
core as the protuberance engages the spring catch, the catch bearing against the upper side of the protuberance to hold open the pair of contacts against the force exerted by the biasing means.

4,037,069

MAT SWITCH

Roland Gonzalez, and Raul C. Miguel, both of 135 NE. 134th St., N. Miami, Fla. 33161

Filed Nov. 20, 1975, Ser. No. 633,607
Int. Cl.[2] H01H *13/16*
U.S. Cl. 200—86 R **1 Claim**



1. A mat switch comprising: top and bottom flexible dielectric sheets on which are respectively formed opposed top and bottom planar complementary electrodes adapted to contact each other in response to pressure on said top sheet; said top and bottom electrodes being formed of spaced apart generally parallel elongated first metal foil bands adhesively secured respectively to said top and bottom sheets, the first bands of said top electrode being in register with the first bands of said

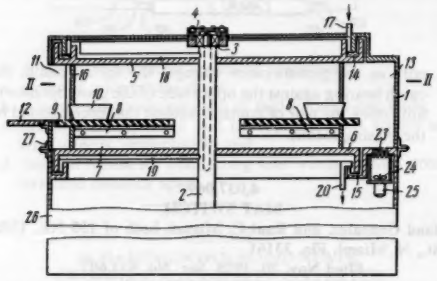
bottom electrode; amiddle dielectric sheet sandwiched between said top and bottom electrodes; said middle sheet having a plurality of spaced apart generally parallel elongated apertures in register with said first bands; said first and second electrodes each further comprising a pair of second metal foil bands running perpendicular to and overlapping the first bands along opposite extremes of said first bands; first and second lead wires; a first metal staple attaching said first lead wire to one of the second bands of said top electrode; and a second metal staple attaching said second lead wire to one of second bands of said bottom electrode.

4,037,070

TURNTABLE-TYPE MICROWAVE CONTINUOUS OVEN

Vladimir Pavlovich Kirpichnikov, Sevastopolsky prospekt, 14, kv. 264, Moscow; Jury Veniaminovich Leibin, ulitsa Raevskogo, 3, kv. 36, Leningrad; Samuil Veniaminovich Nekrutman, Lomonosovsky prospekt, 19, kv. 264, Moscow, and Alexandr Nikolaevich Vyshelessky, Petrovsko-Razumovsky proezd, 7, kv. 28, Moscow, all of U.S.S.R.

Continuation of Ser. No. 481,844, June 21, 1974, abandoned.
This application June 18, 1975, Ser. No. 587,885
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A **2 Claims**



1. A turntable type microwave continuous oven with a loading section and a shielded cooking section, comprising: a housing; a microwave electromagnetic oscillator connected to the inner space of said housing for generating electromagnetic oscillation thereinside; a rotor made from current-conducting material positioned inside said housing and in coaxial relationship therewith, the shaft of the rotor carrying two disks installed in a plane perpendicular to that of the shaft rotation; the space confined within said disks being divided by radial partitions rigidly connected to said disks and shaft, which together form sections; dielectric shelves accommodated in said sections for carrying the product being treated about said shaft; said housing being of such cross-sectional shape that in the course of rotation of said rotor a number of said radial partitions which form locking compartments are in contact, through their outer edge, with the inner surface of said housing, while the remaining radial partitions are at a distance from the inner surface of the housing so as to form therewith a working chamber communicating with said microwave electromagnetic oscillator; a loading-unloading opening being arranged between said locking compartments in said housing.

4,037,071

METHOD AND APPARATUS FOR IMPROVED DISTRIBUTION OF MICROWAVE POWER IN A MICROWAVE CAVITY

Harold B. Kaufman, Jr., New York; John H. Moyer, Garden City, and John P. McCarthy, College Point, all of N.Y., assignors to DCA Food Industries Inc., New York, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,253
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 F **13 Claims**

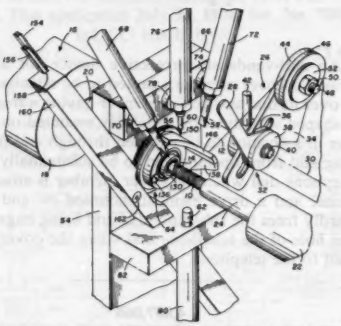
1. A system for distribution of microwave power within a microwave cavity, comprising a source of microwave power, a wave guide coupled to receive microwave power from said source of microwave power and having a microwave outlet port adapted to communicate with the interior of the microwave cavity for introducing microwave power into the interior thereof and means operatively coupled to said wave guide for selectively varying the orientation of the outlet port of said wave guide within said microwave cavity so that the direction in which microwave power is introduced into said microwave cavity can be controlled to produce a varying distribution of microwave power within said microwave cavity.

4,037,072

APPARATUS FOR FABRICATING RESISTORS

Paul W. Johnson, Decatur, Ind., assignor to E-Systems, Inc., Dallas, Tex.

Filed Dec. 22, 1975, Ser. No. 643,477
Int. Cl.[2] B23K *11/10*; B23B *5/00*; H01C *17/04*
U.S. Cl. 219—56 **17 Claims**



10. Apparatus for fabricating a wire wound resistor on a rotating core, comprising in combination:

a carriage positioned to move along the longitudinal axis of the rotating core,

a chuck mounted to said carriage and including:

a first supporting member mounted transverse of and coaxial with the longitudinal axis of the rotating core,

a first jaw supported on said first member and extending in a direction along the longitudinal axis of the rotating core,

a second supporting member juxtapositioned said first member and mounted coaxial with the longitudinal axis of the rotating core,

a second jaw supported on said second member and extending in a direction along a longitudinal axis of the rotating core,

means for rotating one of said members relative to the other between an open position and a wire gripping position where said first and second jaws are in side-by-side contact,

welding means mounted to said carriage along an axis transverse of the longitudinal axis of the rotating core and including welding electrodes positionable transversely with respect to the rotating core, and

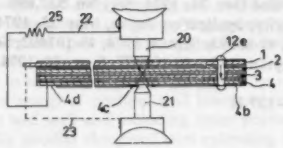
shearing means mounted to said carriage along an axis transverse of the longitudinal axis of the rotating core and including cutters transversely positionable with respect to the core.

4,037,073

RESISTANCE WELDING OF SHEET METAL COATED WITH LAYERS

Otto Alfred Becker, 59 Robert-Koch-Strasse, 66 Saarbrucken 6, Germany

Division of Ser. No. 102,950, Dec. 30, 1970, Pat. No. 3,897,593, which is a division of Ser. No. 704,684, Feb. 12, 1968, Pat. No. 3,643,057. This application July 25, 1974, Ser. No. 491,857
Claims priority, application Germany, Feb. 11, 1967, 91162; May 26, 1967, 92707; Apr. 24, 1967, 92210; Feb. 27, 1967, 91404
Int. Cl.[2] B23K *11/10*
U.S. Cl. 219—92 5 Claims



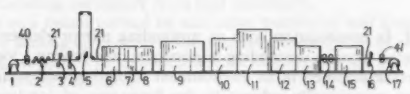
1. A method for resistance welding of a first insulation-coated sheet metal to at least two other insulation-coated sheet metals, comprising:
establishing a first welding electrode in direct engagement and electrical contact with said first sheet metal;
spacing a second welding electrode from a second sheet metal with the insulation coating of said second sheet metal between said second sheet metal and said second welding electrode;
maintaining said electrodes generally alligned with said sheet metals therebetween and insulated from each other;
establishing a shunt with a resistor from said second electrode to a stripped area of said first sheet metal independently of said second sheet metal;
effecting electrical contact between said sheet metals at a point spaced from said region to be welded and independently of said shunt;
while maintaining the above steps, serially passing current from said second welding electrode through said shunt, through said first metal and to said first welding electrode with said second sheet metal being out of the series circuit, and thereby generating sufficient heat to melt said insulation on all sheet metals in the region to be welded between said electrodes; and
subsequently applying pressure on said electrodes against said sheet metals so that said melted insulation is displaced in the region to be welded, electrical contact between said sheet metals is made, and welding is effected.

4,037,074

APPARATUS FOR THE CONTINUOUS APPLICATION OF A METALLIC COATING TO A METAL STRIP

Felix Montbrun, Quai Sadoine, 8, B.4100 Seraing, and Roland Liesenborghs, Avenue du Hetre, 22, B.4200 Sclessin, both of Belgium

Filed Apr. 22, 1975, Ser. No. 570,472
Claims priority, application Belgium, Apr. 22, 1974, 44555
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 P 5 Claims



1. Apparatus for the continuous application of a metallic coating to a metal strip, comprising:
an airtight enclosure,
means for continuously advancing the metal strip lengthwise of itself through said enclosure
at least one plasma torch for projecting molten metal onto the continuously advancing metal strip
a trolley carrying said plasma torch
fixed rails carrying said trolley and extending parallel to the plane of said metal strip and perpendicular to the longitudinal direction thereof
means for reciprocating said trolley with said plasma torch, on said rails, within said enclosure across the entire width of said metal strip
and means for maintaining an inert atmosphere in said enclosure.

4,037,075

IMAGE REPRODUCTION SYSTEMS

Peter C. Pugsley, Pinner, and Philip R. Kellner, Amersham, both of England, assignors to Crosfield Electronics Limited, London, England

Filed May 16, 1975, Ser. No. 578,143
Claims priority, application United Kingdom, May 16, 1974, 21847/74
Int. Cl.[2] G03F *1/00*
U.S. Cl. 219—121 LM 2 Claims

1. A method of preparing a film or plate, for use in the preparation of a printing plate for providing a screened reproduction of an image, comprising the steps of:
scanning a laser beam over the film or plate, the film or plate comprising a substrate having a plane surface and a coating on which the laser beam is incident, the substrate being substantially less susceptible to the action of the laser beam than the coating;
modulating the laser beam in an on-off manner with the required screened-image densities of the image to be reproduced, whereby the coating material is selectively removed to leave only image-representing coating dots on the substrate;
and thereafter correcting the film or plate by subjecting the remaining image-representing coating dots to the action of a chemical agent;
and in which the said coating comprises a first layer on the substrate and a second layer which is superimposed on the first and is substantially more resistant to attack by the chemical agent than the first layer and thereby protects the underlying surface of the first layer, whereby the said image-representing dots are affected by the chemical agent from their side walls of the said first material inwards and their effective size is reduced.

4,037,076

APPARATUS FOR BALANCING ROTATING BODIES

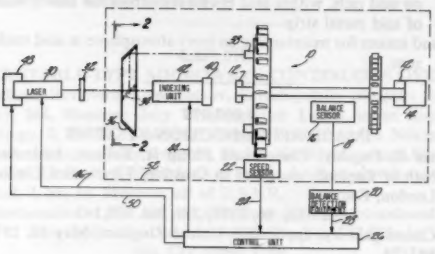
Benjamin E. Blackaby, Maumee, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 18, 1975, Ser. No. 642,155
Int. Cl.[2] B23K *26/00*
U.S. Cl. 219—121 L 5 Claims

1. Apparatus for balancing a rotating body comprising:
means for rotatably mounting said body,
means for rotating said body,
means for detecting unbalance of said body and for generating an unbalance signal in response thereto,
control means for computing the amount and location of compensating material to be removed from said body in

response to said unbalance signal in order to balance said body, and

machining means for removing said amount of compensating material at said location, said machining means further comprising an angled mirror and means for rotating the mirror coaxially with the rotating body, a laser positioned to direct a laser beam axially toward the rotating mirror whereby the mirror reflects the laser beam radially outwardly from the rotational axis of the mirror, means for



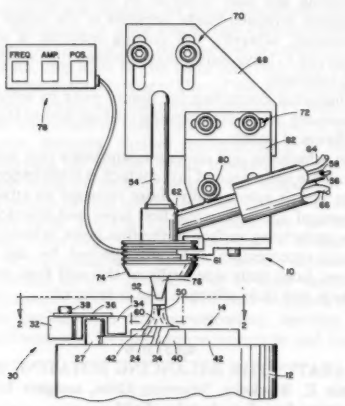
synchronizing the rotational speed of said mirror to the rotational speed of said body, a stationary annular reflector disposed radially outwardly from and coaxially with said mirror, whereby said mirror reflects said laser beam to said reflector which in turn reflects said laser beam axially toward said rotating body so that said laser beam impinges substantially perpendicularly on said rotating body to thereby remove said compensating material therefrom.

4,037,077

BATTERY WELDING METHOD

Steven H. Harder, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 2, 1976, Ser. No. 710,756
Int. Cl.[2] B23K *9/08*
U.S. Cl. 219—123 **5 Claims**



1. In a method for joining lead parts together in a lead-based battery by passing an electrode arc derived from an inert-gas-shielded, non-consumable electrode across the lead parts to at least partially melt them, and wherein the flow of the melted lead parts is contained by a mold means of sufficiently high thermal conductivity to act as a rapid heat sink, and which surrounds the lead parts, the improvement comprising:

striking the electrode arc substantially directly over the lead parts; and

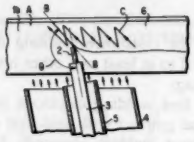
passing the electrode arc in substantially a straight line over the lead parts longitudinally thereof, in excess of one full pass across the lead parts, at a speed and current to cause the lead parts to flow and weld together and be confined by the mold means.

4,037,078

PROCESS FOR WELDING ALUMINUM AND ALUMINUM ALLOYS IN HORIZONTAL WELDING POSITION

Minoru Oishi; Naoki Okuda, both of Fujisawa; Makoto Tomita, Yokohama; Toshisada Kashimura, Tokyo, and Syozi Koga, Kamakura, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Dec. 31, 1974, Ser. No. 537,698
Claims priority, application Japan, May 23, 1974, 49-58477; July 29, 1974, 49-85993; Sept. 4, 1974, 49-101402; Sept. 4, 1974, 49-101403; Sept. 6, 1974, 49-103377; Sept. 21, 1974, 49-109331
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—137 R **7 Claims**



1. A process for welding aluminum and aluminum alloy base metals in a horizontal welding position, wherein the base metals are placed vertically in abutting relationship to form a weld groove which is open in a sidewise direction, which comprises:

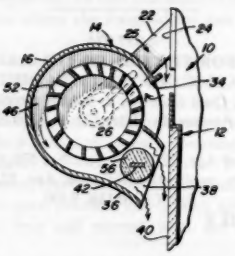
advancing a welding electrode to said weld groove such that the top of said electrode describes an oscillating pattern traversing the depth of said weld groove and such that the angle of the welding direction formed by the surface of the molten metal pool created by the advancing electrode and the vertical plane which includes the electrode axis relative to the groove which is maintained greater than 90°.

4,037,079

BATHROOM MIRROR DEFOGGER

Joseph M. Armbruster, 3701 N. 29th Ave., Hollywood, Fla. 33020

Filed Aug. 6, 1975, Ser. No. 602,306
Int. Cl.[2] H05B *1/00*; E06B *7/12*; F24H *3/04*
U.S. Cl. 219—219 **2 Claims**



1. In combination with an upstanding mirror element supported from an upstanding interior wall and having a viewing surface disposed in an environment rendering said surface at least occasionally subject to the formation of condensation thereon and with said element including a generally horizontal upper marginal edge portion and upstanding opposite side marginal portions between which said upper marginal portion

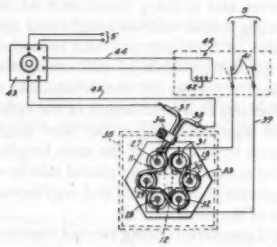
extends, a defogging apparatus comprising an elongated generally cylindrical horizontal housing extending along and supported outwardly of said upper marginal portion, the side of said housing adjacent said upper marginal portion and facing said wall including an upper elongated horizontal air inlet opening and a lower elongated horizontal air outlet opening with said openings extending longitudinally of said housing and opening toward the plane of said surface, said outlet opening being spaced from said inlet opening by a narrow portion of the peripheral wall of said housing and opening in a direction inclined toward the marginal portion of said mirror element remote from said upper marginal portion, motorized blower means including an elongated blower drum disposed within and housing and operative to draw ambient air into said housing through said inlet opening and to discharge air from said housing through said outlet opening, whereby a curtain of air will be directed upon said viewing surface and thereacross toward said remote marginal portion, a pair of bracket members secured to said wall adjacent and above the opposite ends of said upper marginal portion, said brackets extending outwardly from said wall and including outer portions provided with generally parallel elongated slots extending downwardly and outwardly away from said wall and said viewing surface, said housing extending between said brackets, the opposite end portions of said housing including endwise outwardly projecting threaded pivot pins generally coinciding with the longitudinal center axis of said housing and rotatably aad slidbly received in and through said slots, threaded clamp nuts threaded on the outer ends of said pins outwardly of said outer bracket portions releasably clampingly retaining said housing in adjusted rotated and slidingly shifted positions relative to said brackets, an elongated electrical resistance-type heating element disposed in and extending along said outlet opening between the opposite longitudinal sides thereof, said electrical resistance heating element being adapted to be communicated with a suitable source of electrical potential.

4,037,080

PROTECTION AND CONTROL OF ELECTRIC IMMERSION-TYPE HEATER

Donald R. Owen, 211 N. Lincoln St., Hinsdale, Ill. 60521

Filed Jan. 7, 1976, Ser. No. 647,099
Int. Cl.[2] F24H *1/00*; H05B *1/00*
U.S. Cl. 219—328 **8 Claims**



1. An electrically energized control system for substantially maintaining a predetermined condition in respect to a liquid within a receptacle comprising:

a. an immersion-type heater carried by said receptacle and having an inner portion extending inwardly into said receptacle to contact said liquid and an outer portion extending outwardly from said receptacle,

b. sensor means carried by said outer portion of said heater for sensing an excessive self-generated temperature of said heater caused by an undesirable deviation from said predetermined condition,

c. means controlled by said sensor for effecting return to said predetermined condition, and further characterized by said means controlled by said sensor comprising

an electrical power supply means further comprising a power circuit, an electrical power source, and a power relay, said power source connected to said heater by said power circuit through said power relay and to energize said heater,

a control circuit connecting with said sensor means,

a controller means connected to said control circuit and responsive to an output from said sensor means,

a second electrical power source connected to said controller means to energize said controller, and

a power relay circuit to activate said power relay and connected to said relay and said controller means,

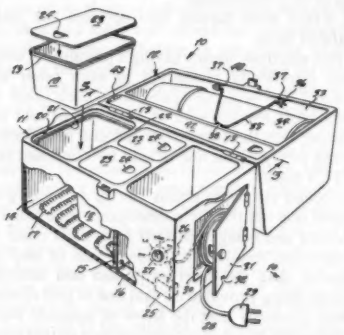
wherein said heater is selectively energized by said power source when said relay is activated by said controller means in response to said sensor.

4,037,081

ELECTRO-LUNCH BUCKET

Bobby V. Aldridge, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed June 21, 1976, Ser. No. 698,076
Int. Cl.[2] F27D *11/02*; A21B *1/52*
U.S. Cl. 219—387 **1 Claim**



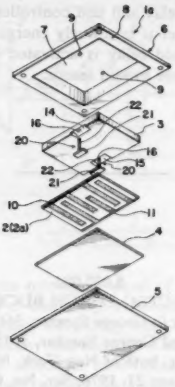
1. An electro-lunch bucket, comprising in combination, a case and hollow compartmented cover pivotally hinged together, said case and cover being of thermally and electrically insulating material, a first compartment in said case for hot food and a second compartment in said case for cold food, said comprtments being separated by an upstanding thermally insulating wall, said first compartment having a bottom wall supporting electric heating coil for heating foods in covered trays mounted in said first compartment, said coil being connected to a heat control unit and switch having means electric lead for connection to an electric power source, said first compartment having an upper opening encompassed by a ledge to support said trays by means of a flange about the tray top cover having a first compartment formed internally of said cover to house a thermosbottle retained from falling out by a pivotable wire clip, and including a second compartment formed in said cover to store silverware and a salt and pepper shaker supported in a cage formed on an underside of a lid of said second compartment of said cover, said lid being pivotally secured on one end to the underside of the cover, whereby said lid and cage may be pivotally move to an open position externally of the cover compartments.

4,037,082

POSITIVE TEMPERATURE COEFFICIENT SEMICONDUCTOR HEATING DEVICE

Minoru Tamada; Takashi Shikama, and Toshikazu Nakamura, all of Yokaichi, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 30, 1976, Ser. No. 682,041
Int. Cl.[2] H05B 3/10
U.S. Cl. 219—541 6 Claims



1. A positive temperature coefficient semiconductor (PTCS) heating device comprising:

a. a PTCS body having two opposed flat and mutually parallel faces;

b. a first electrode means having a plurality of strips of metal film electrically connected to each other at one end thereof and being separated from each other along their respective lengths with at least one of said strips being shorter than the other strips and said first electrode means being provided on one of said two opposed faces of said PTCS body;

c. a second electrode means having a plurality of strips of metal film electrically connected to each other at one end thereof and being separated from each other along their respective lengths with at least one of said strips being shorter than the other strips and said second electrode means being provided on said one of said opposed faces in such a manner that the strips of opposite electrodes are alternately disposed on said one face so that adjacent strips of the respective strips are members of different ones of said first and second electrode means;

d. a first terminal of a pair of terminals for applying a predetermined voltage to said first electrode means and provided on the other of said opposed faces at such a position that said first terminal does not overlap, through the PTCS body, with any of the strips of said second electrode means;

e. a second terminal of said pair of terminals, said second terminal electrically connected to said second electrode means and provided on said other of said opposed faces at such a position that said second terminal does not overlap, through the PTCS body, with any of the strips of said first electrode;

f. a lower insulating means provided on a lower face of said two faces of the PTCS body for electrically insulating said electrodes;

g. an upper insulating means provided on an upper face of said two faces of the PTSC body for electrically insulating said terminals;

h. a metallic heat emission plate provided directly below said lower insulating means for emitting heat therefrom obtained from said PTCS heating element through said lower insulating means;

i. a metallic case means for entirely covering said PTCS heating element and said lower and upper insulating means together with said heat emission plate; and

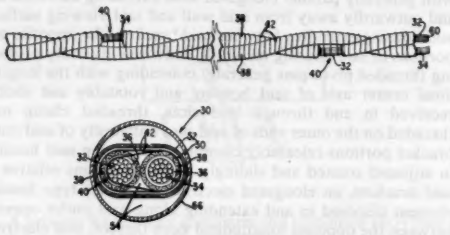
j. a pair of terminal units each having base portions for electrically connecting with corresponding said terminals and a pin portion extending outwardly from said case means through said upper insulating means for connecting to an electrical power supply.

4,037,083

HIGH TEMPERATURE PARALLEL RESISTANCE PIPE HEATER

Joseph E. Leavines, P.O. Box 310, 2 Sierra Circle, New Braunfels, Tex. 78130

Filed May 5, 1976, Ser. No. 683,299
Int. Cl.[2] H05B 3/10
U.S. Cl. 219—552 2 Claims



1. A high-temperature parallel-resistance pipe heater cable capable of being operated at a temperature level of approximately 600° F on a sustained basis and capable of withstanding temporary occasional heating up to 1,000° F comprising

a pair of flexible electrical conductors, each conductor including a multiplicity of fine strands of nickel-clad copper wire,

a primary layer of micaceous insulation wrapped around each of said conductors,

a secondary insulation layer of fiberglass threads tightly braided over said primary layer, each of said fiberglass threads being coated with an anti-fraying agent,

short sections of both primary and secondary insulation being stripped from both of said conductors to expose short bared segments of the conductor at uniformly spaced intervals along the length of the conductor, all of said bared segments being of the same length and being spaced apart by intervals of the same length,

said insulated conductors being placed side-by-side with the bared segments of one located mid-way between the bared segments of the other,

said insulated conductors being twisted together for holding the bared segments of one mid-way between the bared segments of the other along the length of said twisted pair,

a nickel-alloy resistance wire helically wound around said twisted pair with at least two bights of the resistance wire engaging each of the bared conductor segments occurring along the length of the twisted pair for providing a multiplicity of contact points of high unit area pressure where each of said bights of the nickel-alloy resistance wire presses against the nickel-clad surfaces of the fine copper strands,

a layer of micaceous insulation wrapped over said helically-wound resistance wire,

an outer jacket of fiberglass strands braided tightly over said latter micaceous insulation layer, and

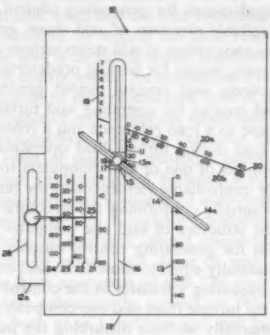
a stainless steel tubular sheath surrounding said fiberglass braided jacket.

4,037,084

DECOMPRESSION PLAN CALCULATOR

Ali A. Seireg, Madison, Wis., and Amr M. S. Baz, Cairo, Egypt, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 9, 1976, Ser. No. 665,174
Int. Cl.[2] G06C *27/00*
U.S. Cl. 235—69 6 Claims



1. A decompression plan calculator, comprising:

a. a working depth having numerical markings thereon representing the working depth d_w of a dive;

b. an initial depth scale having numerical markings thereon representing the initial depth d_i of a dive;

c. a difference scale having numerical markings thereon;

d. means for indicating on said difference scale the difference $d_i - d_w$ between a numerical value located on said working depth scale and a numerical value located on said initial depth scale;

e. a decompression stop depth scale having numerical markings thereon representing the depth d_{sl} of a decompression stop;

f. an uptake time scale having numerical markings thereon representing the time t_w spent at the working depth, the numerical markings on said uptake time scale being spaced thereon in proportion to e^{t_w/T_u} where T_u is a selected uptake time constant;

g. means for dividing a reading equal to $d_i - d_w$ on said difference scale by a value equal to e^{t_w/T_u} determined on said uptake time scale, adding the working depth d_w located on said working depth scale to the quotient, substracting a constant K equal to the depth of water equivalent to surface absolute pressure, and for indicating the sum

$$\frac{d_w}{2} + \frac{(d_i - d_w)}{2} e^{-t_w/T_u} - \frac{K}{2}$$

on said decompression stop depth scale, whereby such sum is equal to a safe decompression stop depth d_{sl};

h. at least one decompression stop time scale having numerical markings thereon representing the amount of time t_1 that the diver must spend at the decompression stop depth d_{sl} in order to safely surface;

i. means for indicating on said decompression stop time scale a time reading t_1 corresponding to a decompression stop reading d_{sl} on said decompression stop scale wherein t_1 and d_{sl} are related such that the reading t_1 is approximately equal to

$$T_e \ln \left[\frac{K + d_{sl}}{K(s-1) - d_{sl}} \right]$$

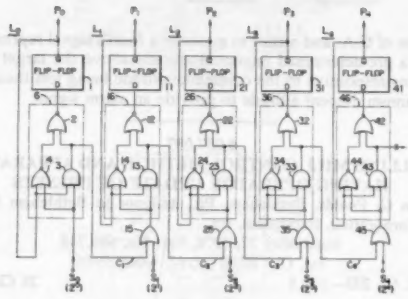
where T_e is selected time constant of eimination not equal to T_u, and where S is a chosen supersaturation ratio.

4,037,085

COUNTER

Kazuo Minorikawa, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,152
Claims priority, application Japan, Aug. 27, 1975, 50-103029
Int. Cl.[2] H03K *21/36*
U.S. Cl. 235—92 LG 2 Claims



1. A counter comprising a plurality of logic units each representative of one of the digits of information data being stored in the counter, each said logic unit except that representative of the least significant digit including an OR circuit having an input terminal for receiving a control input signal for the associated digit, an exclusive OR circuit having an input terminal connected with the output of said OR circuit and a flip-flop circuit having an input terminal connected with the output of said exclusive OR circuit, the output of said flip-flop circuit being indicative of the value of the associated digit, said exclusive OR circuit having another input terminal connected with the output of said flip-flop circuit, the logic unit representative of the least significant digit including another exclusive OR circuit having an input terminal for receiving a control input signal for the least significant digit and another flip-flop circuit having an input terminal connected with the output of said another exclusive OR circuit, the output of said another flip-flop circuit indicative of the value of the least significant digit, said another exclusive OR circuit having another input terminal connected with the output of said another flip-flop circuit, the OR circuit of each of said logic units having another input terminal to which a carry signal from the logic unit representative of the next lower order digit is supplied.

4,037,086

VERTICAL NAVIGATION GUIDANCE SYSTEM

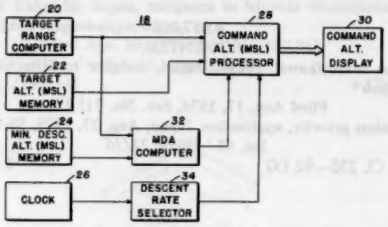
George B. Foster, Worthington, and Paul Douglas Gibbs, Blacklick, both of Ohio, assignors to Air Data, Inc., Worthington, Ohio

Filed June 5, 1974, Ser. No. 476,514
Int. Cl.[2] G06F *15/50*; G01C *21/20*
U.S. Cl. 235—150.22 15 Claims

1. A vertical navigation guidance computer comprising means for receiving first signal representing the range from an aircraft to a target location; means for generating a second signal representative of a desired descent rate; means for generating a third signal representing the altitude of the target location above the mean sea level; processing means responsive to said first, second, and third signals for generating a command altitude value in accordance with the equation:

C.A. R tan (a) + A

where C.A. is the command altitude, R is the range, (a) is a desired descent angle, and A is the altitude above mean sea level of the target location; means to display the generated



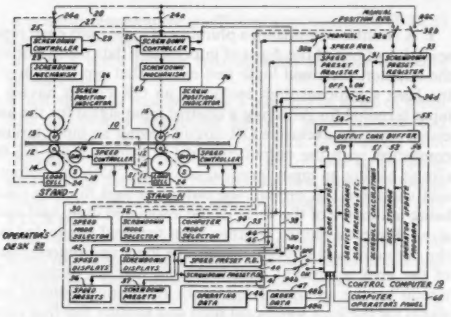
value of C.A. and means to generate a fourth signal representing a pre-determined minimum altitude above the target and means responsive to the command altitude being less than the minimum descent altitude to provide an alarm signal.

4,037,087

ROLLING MILL CONTROL METHOD AND APPARATUS HAVING OPERATOR UPDATE OF PRESETS

John G. Foulds, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 27, 1976, Ser. No. 690,748
Int. Cl.[2] B21B *37/12*; G06F *9/06*
U.S. Cl. 235—151.1 **28 Claims**



1. A method of controlling a rolling mill having a presettable operating parameter, which method comprises:

a. establishing a rolling schedule after receiving input data,

b. presetting the mill operating parameter to a reference level obtained from the rolling schedule and operating the mill parameter at said reference level during an automatic mode of operation,

c. calculating a modifier for the preset reference level during mill operation in response to an operator updating the parameter preset device, the same preset device being used for a second mode of mill operation, and

d. subsequently adjusting the mill operating parameter reference level proportional to the calculated modifier.

4,037,088

WIDE LOAD RANGE SYSTEM FOR TRANSFERRING TURBINE OR PLANT OPERATION BETWEEN COMPUTERS IN A MULTIPLE COMPUTER TURBINE AND POWER PLANT CONTROL SYSTEM

Guy E. Davis, Martinez, Calif.; Francesco Lardi, Pittsburgh, and William D. Ghrist, III, Washington, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1973, Ser. No. 413,273
Int. Cl.[2] F01D *17/02*; G05B *15/00*; G06F *15/06*
U.S. Cl. 235—151.21 **7 Claims**

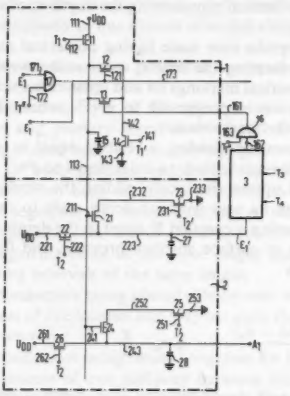
1. A control system for an electric power plant having at least one steam turbine and a steam generator, said control system comprising multiple digital computers including at least a first digital computer and a second digital computer, means for generating input signals representing predetermined process variables associated with said steam generator, means for generating input signals representing turbine load and other predetermined process variables associated with said steam turbine, means for coupling the input signals to both of said computers each of said computers having means for controlling its sequential programmed operation and including substantially identical means for generating control outputs for operating controllable elements of said steam generator and throttle and governor valves of said steam turbine as a function of the input signals, means for sensing predetermined control system malfunctions, said control output generating means including a load control for operating said turbine governor valves in response to a load reference and a representation of actual turbine load during turbine load operation, means for coupling the outputs of one of said computers to operate the steam generator controllable elements and the turbine valves, means for substantially conforming the structure of the other computer to the structure of said one computer in real time including means for generating control outputs in the other computer substantially equal to those from said one computer, and means for executing a transfer in the control of the steam generator and the turbine from said one computer to said other computer substantially without disturbing the power generation when said sensing means detects a control system malfunction.

4,037,089

INTEGRATED PROGRAMMABLE LOGIC ARRAY

Karlheinrich Horninger, Eglharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 20, 1975, Ser. No. 633,959
Claims priority, application Germany, Nov. 21, 1974, 2455178
Int. Cl.[2] G11C *15/00*; H03K *19/08*
U.S. Cl. 235—152 **19 Claims**



1. An integrated circuit programmable logic array, comprising an AND matrix with row lines and column lines, a plurality of inputs connected to the row lines of the AND matrix and a plurality of outputs connected to column lines of the AND matrix: an OR matrix with row lines and column lines, said column lines being connected to receive inputs from the outputs of said AND matrix and a plurality of outputs connected with row lines of the OR matrix, said AND matrix and said OR matrix each having switching transistors interconnecting said row lines and column lines in accordance with the programming of the matrixes; a column transistor for each column line of said AND matrix, means for connecting a first source of electrical potential to each of said column lines of said AND matrix through its respective column transitor when said col-

umn transistor is rendered conductive, said switching transistors of said AND matrix being connected to said column lines and operative to individually connect a second source of electrical potential to said column lines when said AND matrix transistors are rendered conductive by a signal applied to their row lines, a storage capacitor connected with each of said column lines, said switching transistors of said OR matrix being connected to the row lines of said OR matrix and operative to individually connect said row lines to a third source of electrical potential when said OR gate switching transistors are rendered conductive by signals on their respective column lines, said OR matrix including a row transistor for each row line of said OR matrix, means for connecting a fourth source of electrical potential to each of said row lines of said OR matrix through its respective now transistor when said row transistor is rendered conductive, a storage capacitor connected with each of the rows of said OR matrix; a plurality of control transistors, each interconnected between a plurality of said switching transistors and a source of electrical potential for selectively rendering said switching transistors non-conductive; and a delaying feedback circuit connected between an output of said OR matrix and input of said AND matrix, whereby data from an output of said OR matrix is logically linked with data subsequently present on the inputs of said AND matrix, both of said matrixes and said feedback circuit being constructed of dynamically operated storage elements, said feedback circuit including feedback switching transistor in said OR matrix for interconnecting a column line with a feedback row line of said OR matrix, said first feedback switching transistor being connected for selectively connecting its respective row with said third source of potential in response to a signal on said column line, said feedback row line of said OR matrix being connected to the input of said feedback circuit, and including a second feedback switching transistor in said AND matrix for interconnecting a column line with the output of said feedback circuit, said second feedback switching transistor being connected for selectively connecting its respective column line with said second source of electrical potential in response to a signal from said feedback circuit.

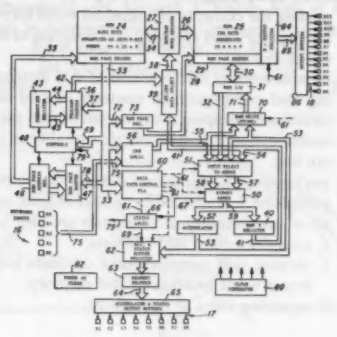
4,037,090

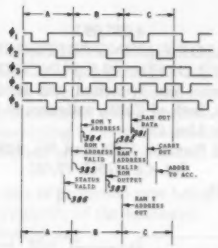
MULTIPHASE CLOCKING FOR MOS

Joseph H. Raymond, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 525,246, Nov. 19, 1974, abandoned.
This application Aug. 9, 1976, Ser. No. 713,062
Int. Cl.[2] G06F *1/04*
U.S. Cl. 235—152 **22 Claims**

18. An electronic digital system implemented in large scale integrated semiconductor means, comprising: data storage means including a plurality of memory cells; addressing means for accessing the data storage means; program instruction storage means; addressing means for accessing the instruction storage means; arithmetic means for performing arithmetic operations on a plurality of parallel data bits applied thereto; control means receiving instruction words from the instruction storage means and generating command signals for defining the operation of the system; timing means in the system defining a recurring machine cycle of a given length during which the data storage means is accessed, the instruction storage means delivers an instruction word to the control means, the control means generates commands from such instruction word, and the arithmetic means receives an input, the improvement wherein the timing means includes means for generating multiple clock voltages within each machine cycle, including a first clock voltage having a first interval during which the data storage means is accessed, a second clock voltage having a second interval during which the instruction storage means delivers an instruction word to the control means, the first and second intervals not overlapping, and a third clock voltage having two distinct pulse intervals in each machine cycle with one pulse interval occurring during part of said first interval and the other pulse interval occurring during part of said





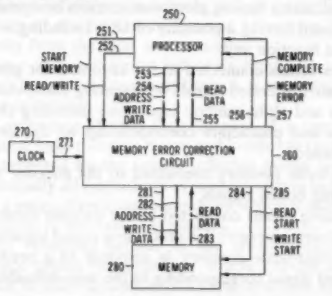
second interval, the third clock voltage being used in said addressing means for the instruction storage means.

4,037,091

ERROR CORRECTION CIRCUIT UTILIZING MULTIPLE PARITY BITS

Hugo Jacob Beuscher, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,464
Int. Cl.[2] G06F *11/10*; G11C *29/00*
U.S. Cl. 235—153 AM **13 Claims**



1. A method for correcting errors in a memory comprising one or more words and applying the corrected words to a destination circuit where each data word in said memory comprises:

a plurality of data bits and a plurality of parity bits; and

said method is practiced in an error correcting circuit comprising:

read and write circuitry for said memory;

parity check means;

complementing means; and

output circuitry for transmitting corrected words to a destination circuit;

said method comprising the following steps:

a. reading the contents of a selected word location from said memory and applying said contents to said parity check means,

b. complementing said contents of said memory, applying said complemented contents of said destination circuit and stopping if the output of said parity check means indicates that all of said plurality of parity bits are bad,

c. performing the following steps if the output of said parity check means indicates that at least one but not all of said plurality of parity bits are bad:

1. complementing said contents,

2. writing said complemented contents into said selected word location of said memory,

3. repeating steps a) through b).

4,037,092

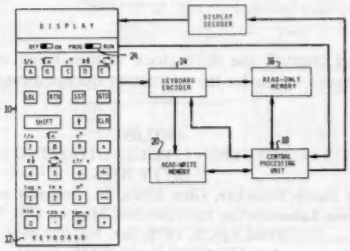
CALCULATOR HAVING PREPROGRAMMED USER-DEFINABLE FUNCTIONS

Thomas E. Osborne, San Francisco, and Richard Kent Stockwell, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 26, 1973, Ser. No. 419,153

Int. Cl.[2] G06F *15/02*

U.S. Cl. 235—156 **6 Claims**



1. A calculator having electronic circuits comprising:

a keyboard having a plurality of keys including a user-definable function key;

encoder means connected to the keyboard for generating a plurality of coded signals representing manipulative functions and alphanumeric characters including those functions and characters corresponding to the keys in the keyboard;

a read-write memory connected to the encoder means for storing coded signals;

computing means connected to the encoder means and the read-write memory for processing coded signals stored in the read-write memory in response to a predetermined coded signal corresponding to the user-definable function key;

power means connected to the electronic circuits including the encoder means, the read-write memory and the computing means for causing electrical power to be applied to the electronic circuits; and

preprogram means connected to the read-write memory and the power means for establishing, in response to the application of power to the electronic circuits, a program of one or more coded signals in the read-write memory that can be processed in the computing means in response to the generation of the predetermined coded signal.

4,037,093

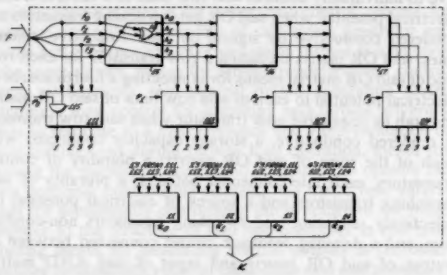
MATRIX MULTIPLIER IN GF(2[m])

Gordon E. Gregg, Tempe; Thomas H. Howell, and Leonard Rabins, both of Scottsdale, all of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 29, 1975, Ser. No. 644,776

Int. Cl.[2] G06F *7/52*

U.S. Cl. 235—164 **5 Claims**



1. An apparatus for multiplying arbitrary field elements F(*x*) and P (*x*) (where $F(x)=f_ix^i$, $P(x)=P_ix^i$ for *i* from 0 to $m-1$) in a Galois field GF(2^m), where $g(x)-g_ix^i$ ($i=0$ to m) is a generator polynomial for said Galois field, comprising:

$m-1$ ordered multiplying means, the first of said ordered multiplying means responsive to signals representing field elements of $F(x)$, the remainder of said ordered multiplying means responsive to output signals from the preceding one of said ordered multiplying means, each of said multiplying means multiplying its output by x and producing a result modulo $g(x)$;

m ordered logical means, the ith of said logical means coupled to the $(i-1)$ of said multiplying means and having input signals $x^iF(x)$, ith logical means gating its input by p_i and producing a partial product of PxG_i and PxF from

m summing means responsive to said m logical means for receiving said partial products, said summing means generating signals corresponding to the product $P+F$ modulo $g(x)$, each member of said summing means responsive to a corresponding component of a partial product of each of said logical means.

4,037,094

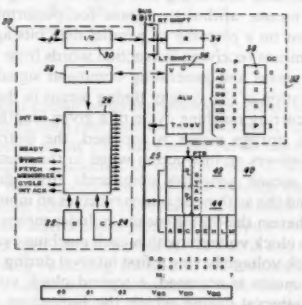
MULTI-FUNCTIONAL ARITHMETIC AND LOGICAL UNIT

Jerry L. Vandierendonck, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1971, Ser. No. 176,664

Int. Cl.[2] G06F *7/48*

U.S. Cl. 235—175 **1 Claim**



1. In a calculating system which includes data storage means for storing data which is to be arithmetically processed, and

wherein arithmetic operations which can be effected by the calculating system are respectively defined by preselected combinations of binary bits in instruction words, an arithmetic logic unit comprising:

logic control means for receiving each instruction and generating, responsive thereto, a discrete output enable signal corresponding to the arithmetic operation defined by said instruction;

arithmetic logic means connected to receive said output enable signal, said arithmetic logic means including a plurality of logic gates selectively coupled to said storage means for accessing data stored therein, said arithmetic logic means for executing an arithmetic operation, the arithmetic logic means being responsive to said enable signal to effect the selected arithmetic operation on said data accessed from said storage means, said arithmetic logic means integrated on a single semiconductor chip adjacent said storage means and said logic control means, and selectively interconnected therewith by a single parallel bus system; and

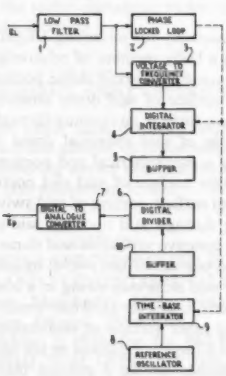
logic means for selectively connecting said storage means, said logic control means, and said arithmetic logic means to said bus system for controlling transmittal of data therebetween.

4,037,095

SIGNAL STABILIZING CIRCUITS

Edward Morris Howells, Abernethy, and Cheung Yun Chan, Mount Hutton, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Sept. 17, 1975, Ser. No. 614,157
Claims priority, application Australia, Sept. 18, 1974, 8949/74
Int. Cl.[2] G06G *7/18*; H03K *5/00*
U.S. Cl. 235—183 **9 Claims**



1. A signal processing circuit for removing unwanted cyclic and/or random components from a composite d.c./cyclic signal, said circuit comprising means for connecting a source of said composite signal to:

a. means for determining the period of the signal; and

b. means for integrating said signal over its period; and

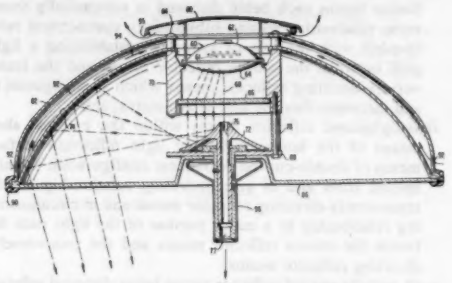
means joined to the period determining means and to the integrating means for dividing the integrated composite signal by the period thereof to produce the average of the composite signal over one period.

4,037,096

ILLUMINATOR APPARATUS USING OPTICAL REFLECTIVE METHODS

Thomas Brendgord, and Kenneth J. Fisher, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Aug. 9, 1974, Ser. No. 496,166
Int. Cl.[2] A61G *13/00*; F21V *33/00*
U.S. Cl. 240—1.4 **10 Claims**



1. Illuminator apparatus for surgical lighting and similar lighting requirement uses comprising

a luminaire having a reflective optical system which is free of refracting means and which projects light in a pattern which is converging in axial cross section and substantially symmetrical about the principal axis of projected rays,

such principal axis of projected rays being coextensive with the axis of symmetry of the luminaire,

the luminaire comprising

light source means contiguous to the axis of symmetry and substantially symmetrically disposed with respect to the axis of symmetry,

optical means establishing a plurality of light reflection paths and projecting light rays in a forward direction toward an area to be illuminated which is substantially transverse to such principal axis,

internal frame means for positioning and supporting the light source means and optical means, and

external shell means for the luminaire,

the optical means comprising

source reflector means operationally associated with the light source means,

such source reflector means being at least partially circumscribing of the light source means to receive light rays directly from the light source means,

the source reflector means reflecting light rays to have a major directional component which is substantially axial of the luminaire,

a light reflecting surface forming part of a transversely-directing light reflector means and located to receive light rays reflected by the source reflector means and reflect substantially all frequencies of such impinging light rays to have a major directional component which is substantially transverse to the axis of symmetry,

the light reflecting surface of the transversely-directing reflector means comprising a double curved reflecting surface of curved conical-like cross sectional configuration with the apex of such curved conical-like configuration oriented toward the light source means,

such double curved reflecting surface of the transversely-directing reflector means comprising the surface of revolution of an arc about the axis of symmetry presenting its concave side in confronting relationship to the light source means,

such transversely-directing reflector means and the source reflector means being located along the axis of symmetry in proximate relationship within the external shell means of the luminaire with the source reflector means and the

transversely-directing reflector means being on axially opposite sides of the light source means,

the source reflector means having a double curved reflecting surface located in surrounding relationship to the light source means and opening toward the transversely-directing reflector means with the transversely-directing reflector means receiving reflected light rays from the light source means,

such source reflector means and transversely-directing reflector means each being disposed in substantially transverse relationship to and substantially symmetrical relationship with the axis of symmetry establishing a light path between the source reflector means and the transversely-directing reflector means which is contiguous to and circumscribes the axis of symmetry, and

radially-spaced reflector means within the external shell means of the luminaire having light reflection surface means of double-curved curvilinear configuration radially spaced from and in circumscribing relationship to the transversely-directing reflector means and in circumscribing relationship to a major portion of the light path between the source reflector means and the transversely-directing reflector means,

such radially-spaced reflector means being disposed substantially symmetrically with relation to the axis of symmetry in a position to receive solely light rays reflected from the transversely-directing reflector means, such light rays being reflected in angled relation to each other toward the radially-spaced reflector means so as to cross in focal relationship intermediate such transversely-directing reflector means and such circumscribing radially-spaced reflector means,

the radially spaced reflector means reflecting such light rays with a major component in a forward direction toward the area to be illuminated in angled relation toward the principal axis, forming a converging pattern of light rays in axial cross-section,

such angled reflection of light rays from the circumscribing radially-spaced reflector means reducing shadow formation within the converging pattern of light rays and establishing with such transversely-directing reflector means a zone having a conical configuration in axial cross-section and located along the principal axis contiguous to the illuminator and extending in the forward direction with its apex toward the area to be illuminated,

such conical configuration zone being free of reflected light rays projected from the radially-spaced reflector, and

being characterized by shadow-free properties with respect to reflected light rays projected by the radially-spaced reflector means.

4,037,097

COLOR CHANGER FOR SPOTLIGHTS

Allen M. Stillman, and Theodore Stillman, both of 1954 E. 26th St., Brooklyn, N.Y. 11229

Filed Apr. 4, 1975, Ser. No. 565,072

Int. Cl.[2] F21P *5/04;* **F21V** *11/18, 9/08;* **G02R** *7/00*

U.S. Cl. 240—3.1 **7 Claims**

1. A slide changer mechanism for use with a light source comprising:

at least one slide,

a respective individually energizable actuator means for each said slide,

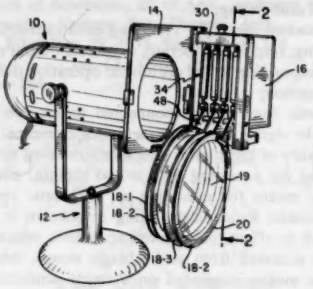
a respective, pivotally mounted crank means for each said actuator means and its corresponding slide,

means for attaching each slide to its respective crank means,

each of said actuator means comprising a pneumatically operated cylinder having a bi-directional linearly moving piston having a free end, means for pivotally connecting a said crank means to the free end of its respective piston,

means for selectively providing fluid to each said pneumatic cylinder to cause its piston to move in one direction or the other,

and means for mounting each said cylinder with respect to its respective crank means to provide free rotation of said



crank means in both directions about its pivot mounting as the piston of the pneumatic cylinder is moved.

4,037,098

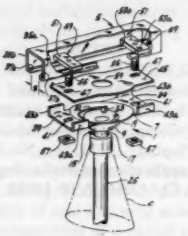
SWIVEL CONNECTOR

Joseph W. Kowalski, Florissant, Mo., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Sept. 5, 1975, Ser. No. 610,644

Int. Cl.[2] F21S *1/06, 3/06*

U.S. Cl. 240—78 R **8 Claims**



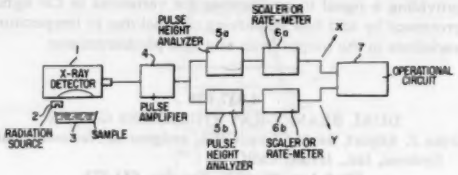
1. A swivel assembly for mounting a lighting fixture or the like comprising a body member of relatively stiff sheet metal which has a generally spherical dome portion formed therein with the inner surface of said dome constituting a generally spherical concave surface, an opening through said body member at the center of said spherical dome portion, a swivel member having a part-spherical end portion larger than said opening, the outer surface of said end portion constituting a convex spherical surface portion of said swivel member, and a stem extending through said opening, said end portion being socketed in the concave surface of said dome for sliding movement of the end portion of the swivel member relative to the dome whereby said stem may swing in a conical path relative to said body member and for axial movement into said opening away from said inner surface of said dome, said stem being adapted to have a length of conduit or the like secured thereto, said swivel member having a passage therethrough for the reception of one or more wires which pass through the conduit so as to supply power to the lighting fixture, and means for limiting rotation of the swivel member about its longitudinal axis relative to said body member, said means for limiting rotation comprising a slot in said body member dome portion extending in generally meridional direction along said spherical dome portion from the edge of said opening therein and a pin secured to said end portion of said swivel member and extending out beyond the outer surface thereof for reception in said slot when said end portion is socketed in said dome portion.

4,037,099

FLUORESCENT X-RAY SULFUR ANALYZER

Minoru Oda, and Shinji Badono, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1975, Ser. No. 631,702
Claims priority, application Japan, Nov. 22, 1974, 49-134479
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—272 3 Claims



1. A fluorescent X-ray sulfur analyzer comprising:
a radiation source for irradiating a sulfur containing hydrocarbon sample with X-rays or γ-rays,
a radiation detector for detecting the radiation generated from the sulfur containing hydrocarbon sample irradiated by the X-rays or γ-rays,
a first analyzer connected to the output of the radiation detector for selecting only fluorescent X-ray pulses from the output of the radiation detector,
a first pulse rate measuring device connected to the output of the first analyzer for measuring the pulse rate of the pulses selected by the first analyzer,
a second analyzer connected to the output of the radiation detector for selecting only pulses of compton scattered rays from the output of the radiation detector,
a second pulse rate measuring device connected to the output of the second analyzer for measuring the pulse rate of the pulses selected by the second analyzer, and
an operational circuit connected to the output of the first pulse rate measuring device and connected to the output of the second pulse rate measuring device for compensating for the error caused by the variation of the carbon-hydrogen ratio to realize an accurate weight content of the sulfur in the sulfur containing hydrocarbon sample by performing the function

$$\frac{S}{\rho} = \frac{X(2.017 - 0.095Y)}{(15.8X + 0.905)Y - (0.7X - 1)}$$

wherein S/ρ is the sulfur mass per unit weight of the sulfur containing hydrocarbon sample, X is the output signal of the first pulse rate measuring device and Y is the output signal of the second pulse rate measuring device.

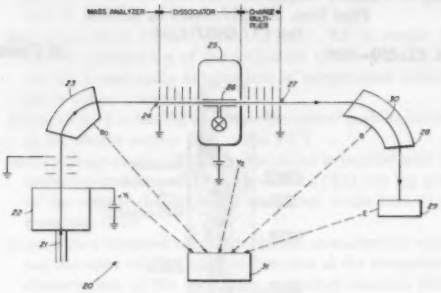
4,037,100

ULTRA-SENSITIVE SPECTROMETER FOR MAKING MASS AND ELEMENTAL ANALYSES

Kenneth H. Purser, Manchester, Mass., assignor to General Ionex Corporation, Ipswioh, Mass.

Filed Mar. 1, 1976, Ser. No. 662,968
Int. Cl.[2] B01D *59/44;* G01K *1/08;* H01J *23/00*
U.S. Cl. 250—281 4 Claims

1. An ultra-sensitive spectrometer for mass and elemental analysis comprising in combination:
a thin target,
means for directing a focussed beam of charged particles of the material to be analyzed through said thin target,
whereby said particles are dissociated into positively charged components,
means for accelerating said components comprising a substantially constant electric field, whereby said components acquire additional kinetic energy the quantity of which depends upon their charge,
and means for filtering, detecting and measuring kinematic characteristics of said components.

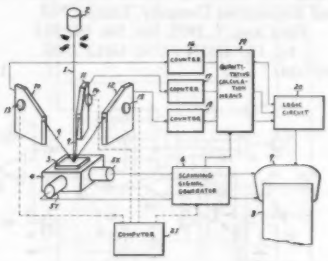


4,037,101

METHOD AND APPARATUS FOR ANALYZING FINE GRAINED SUBSTANCES

Kimio Okumura; Tatsunori Soya; Yosuke Kauchi, all of Kawasaki, and Hideyuki Ohi, Akishima, all of Japan, assignors to Agency of Industrial Science & Technology and Nihon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 19, 1975, Ser. No. 633,233
Claims priority, application Japan, Nov. 29, 1974, 49-138059
Int. Cl.[2] G01N *23/04*
U.S. Cl. 250—310 5 Claims

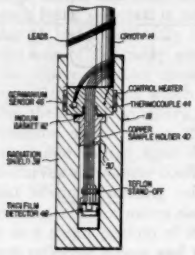


1. In a method of analyzing the fine texture of a specimen comprising the steps for
a. irradiating the specimen surface with a fine diameter electron beam,
b. scanning the irradiating position two-dimensionally over a given area on said specimen surface,
c. measuring the characteristic x-rays produced as a result of beam irradiaton corresponding to certain elements,
d. calculating the content ratios of each element from the results of said characteristic x-ray measurement,
the improvement comprising the steps for
e. generating signals from the content ratios of said elements which are indicative of the chemical phase at the point being irradiated, and
f. displaying said signals to-dimensionally in synchronism with said scanning of the irradiating position.

4,037,102
THIN-FILM SUPERCONDUCTOR DEVICE

John A. Hoyle, Huntsville, Ala.; Robert R. Humphris, and John W. Boring, both of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Filed Sept. 29, 1975, Ser. No. 617,580
Int. Cl.[2] G01T 1/24
U.S. Cl. 250—336 20 Claims



1. A thin-film superconductive apparatus sensitive to extremely small quantities of thermal energy comprising:

a superconductive thin-film forming a narrow strip of non-uniform volume per unit length,

said narrow strip including a main portion having a first average volume per unit length and a channel portion having a second average effective volume per unit length, said second average volume being less than said first average volume;

bias circuit means coupled to said thin-film for passing a bias current through said film,

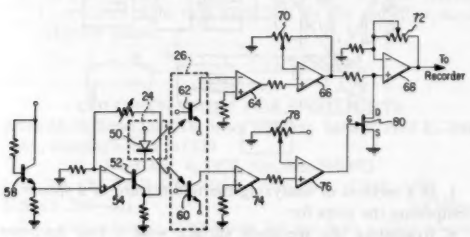
temperature control means cooperating with said film for maintaining the temperature thereof within a predetermined superconductive range; and,

monitoring circuit means coupled to said film for sensing changes in the resistance of said film.

4,037,103
DIAMETER MEASURING SYSTEM FOR CYLINDRICAL OBJECTS

Joseph Ryden, Jr., Richland, Wash., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 7, 1975, Ser. No. 602,513
Int. Cl.[2] G01N 21/30; G01J 1/00
U.S. Cl. 250—341 11 Claims

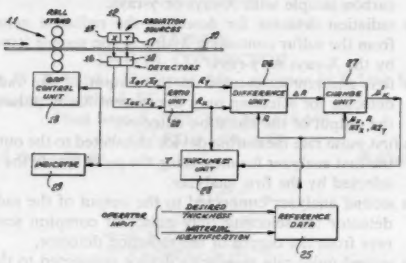


1. A system for the rapid and accurate measurement of a physical parameter such as the diameter of objects, comprising in combination: a diameter measurement station comprising emitter means for impinging a beam of energy on receiver means aligned diametrically opposite said emitter means, said emitter means comprising an infrared diode, said receiver means having an output proportional to the amount of beam energy received thereby; means for translating said objects in a transport channel past said emitter and receiver means arranged on opposite sides of the translating means; and electronic circuit means for receiving the output of said receiver means and compensating for temperature variations in the outputs of said emitter and receiver means and providing an output signal representative of said parameter of said objects, said electronic circuit means comprises transistor amplifier means and an output transistor connected to the output of said amplifier means and including said infrared diode in its collector circuit and feedback circuit means connected between the emitter of said transistor and the input of said amplifier means; said receiver means comprising first and second phototransistors responsive to said infrared diode and connected in first and second amplifying channels, said second amplifying channel providing a signal to compensate for variations in the signal processed by said first amplifying channel due to temperature variations in the output from said first phototransistor.

4,037,104
DUAL BEAM X-RAY THICKNESS GAUGE

John J. Allport, Santa Clara, Calif., assignor to Nucleonic Data Systems, Inc., Irvine, Calif.

Filed Apr. 29, 1976, Ser. No. 681,571
Int. Cl.[2] G01M 23/00
U.S. Cl. 250—359 5 Claims



1. In a system for continuously measuring the thickness of a strip of sheet metal while the composition of the material changes as it moves past a gauging station, the combination of:

source means for generating radiation in first and second energy bands;

detector means positioned for receiving radiation from said source means in each of said bands with the sheet to be measured positionable therebetween, providing as outputs data for a first sheet transmission ratio of radiation flux in the first band transmitted through the sheet to flux transmitted through the air in absence of the sheet, and a second sheet transmission ratio of radiation flux in the second band transmitted through the sheet to flux transmitted through air in absence of the sheet;

reference means having as inputs the desired thickness and identification of the material of the sheet to be measured and providing as an output radiation absorption data in each of said energy bands for the nominal composition of the material;

first means for determining as an output the difference between the nominal and measured composition absorption coefficient ratios of the material as the sheet moves between said source and detector means;

means for connecting the outputs of said detector and reference means to said first means as inputs;

second means for calculating the thickness of the sheet as a function of the sheet transmission ratio and sheet absorption coefficient in said first energy band;

means for connecting the output of said detector means and the sheet absorption coefficient for said first energy band to said second means as inputs;

third means for changing the value of the sheet absorption coefficient for said first energy band as a function of the ratio difference determined by said first means; and

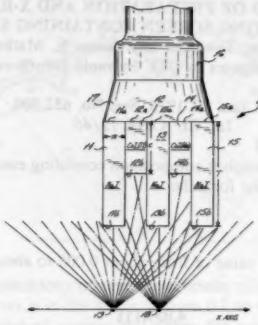
means for connecting the outputs of said reference and first means to said third means as inputs.

4,037,105

RADIATION DETECTOR WITH ARRAY OF DIFFERENT SCINTILLATORS

Gerard R. Laurer, One N. Main St., Monroe, N.Y. 10950

Filed June 1, 1976, Ser. No. 691,572
Int. Cl.[2] G01T 1/20
U.S. Cl. 250—367 3 Claims



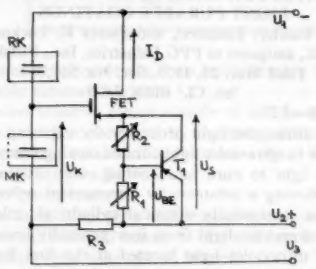
1. An array of scintillators adapted for use without a collimator and in combination with a single photomultiplier tube for detecting the location of a source of electromagnetic radiation, comprising superposed scintillator crystals of three respective different types in their response to electromagnetic radiation, three crystals of a first type being alternated with one crystal each of second and third types, an edge of each of the crystals being exposed at two opposed sides of the array, a first of said opposed sides being adapted to face a photomultiplier tube and the other of said opposed sides being adapted to receive radiation from said source, the respective edges of the second and third types of crystals at the radiation receiving side of the array being in a first plane and the respective edges of the first type of crystals at the radiation receiving side of the array being in a second plane spaced from the first plane.

4,037,106

IONIZATION-TYPE FIRE OR SMOKE SENSING SYSTEM

Andreas Scheidweiler, Stafa-Uerikon, and Otto Meier, Hombrechtikon, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed June 24, 1976, Ser. No. 699,333
Claims priority, application Switzerland, July 25, 1975, 9710/75
Int. Cl.[2] G08C 1/00
U.S. Cl. 250—381 9 Claims



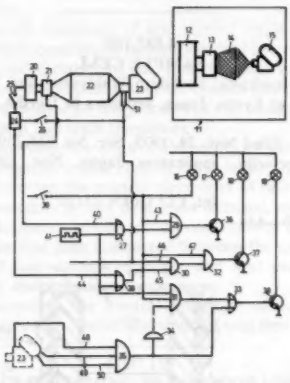
1. Ionization-type fire or smoke sensing system having
a source of electrical supply (U1, U2);
a measuring ionization chamber (MK);
a series resistance element (RK) connected in series with the measuring ionization chamber (MK);
a field effect transistor (FET) connected to the measuring ionization chamber, said FET having a conduction threshold voltage which is just above the level of the output voltage (U_K) of the measuring ionization chamber (MK) when smoke or fire aerosols are absent, so that, upon presence of smoke or fire aerosols, the output voltage of the chamber will rise and the FET will become conductive to provide an output signal;
and temperature control means (T1, R1, R2) to render the circuit combination of the ionization chamber (MK) and the FET essentially independent of temperature within a given range, comprising
a transistor (T1) having its collector-emitter path connected in the source supply path of the FET;
and a voltage divider (R1, R2) connected in parallel with the collector-emitter path of the transistor (T1), the tap point of the voltage divider being connected to the base of the transistor (T1);
to provide a temperature compensation characteristic which has the same relative control direction as the temperature characteristic of the measuring ionization chamber (MK) and dimensioned with respect to the FET to maintain the conduction threshold thereof essentially independent of temperature within said range.

4,037,107

X-RAY DIAGNOSING APPARATUS WITH SEVERAL PHOTOGRAPHING SYSTEMS SELECTIVELY CONNECTABLE TO A COMMON GENERATOR

Herbert Lutz, Seukendorf, and Manfred Pfeiler, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 446,689, Feb. 28, 1974, abandoned. This application Nov. 11, 1975, Ser. No. 630,787
Int. Cl.[2] H05G 1/00
U.S. Cl. 250—402 3 Claims



1. An X-ray diagnosing apparatus for several photographing systems selectively connected to a common generator, each of said systems comprising an X-ray tube, means connecting said X-ray tube to said generator, auxiliary devices for producing exposures, an operating desk for each photographing system having an indicating area, separate signaling lamps for said X-ray tube and said auxiliary devices within said indicating area and connecting means connecting said signaling lamps with the high-voltage generator for said X-ray tube and said auxiliary devices and operating said lamps to indicate operational readiness and trouble-free operation of said X-ray tube and said auxiliary devices in said indicating area, said auxiliary devices comprising film camera means, said indicating area having pictures representing the X-ray tube and the film camera means, one of said signaling lamps being adapted to illuminate the picture representing the X-ray tube and another of

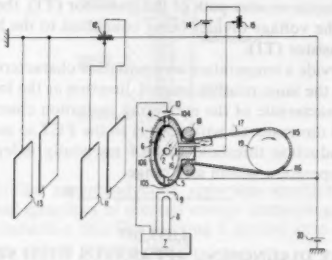
said signaling lamps being adapted to illuminate the picture representing said film camera means.

4,037,108

ION SOURCE WITH CAPABILITY OF CHANGING BETWEEN OPERATION MODES

Helmut Jordan, Njupkarrsvagen 94, Tyreso, and Curt Sivers, Heleneborgsgatan 12, Stockholm, both of Sweden

Filed Mar. 9, 1976, Ser. No. 665,290
Claims priority, application Sweden, Apr. 3, 1975, 7503809
Int. Cl.² H01J *27/00*
U.S. Cl. 250—427 **4 Claims**



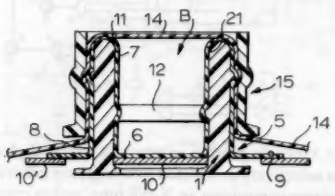
1. Ion source consisting of a cavity and means for supplying the gas to be ionized, an output slot for the ions generated in the ion source and at least one slot through which ionizing particles or radiation can impinge into the cavity, characterized in, that a displaceable band is stretched across the slots of the ion source, whereby the band is provided with a number of combinations of holes so that by suitable adjustment of the band different combinations of slots can be opened and/or be given different widths.

4,037,109

SAMPLE CELL

Yoshinori Hosokawa; Yoshihiro Wakiyama, and Yazyuro Nomura, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Nov. 24, 1975, Ser. No. 634,739
Claims priority, application Japan, Nov. 26, 1974, 49-144688[U]
Int. Cl.² G01N *23/10*
U.S. Cl. 250—444 **4 Claims**



1. A sample cell comprising a disposable inner frame cover **(5)** formed by bending a plastic film, said cover having a bottom part **(6)**, an uprising part **(7)**, a connection part **(11)**, a turndown part **(8)** and a flange part **(9)**; said uprising part **(7)**, connection part **(11)** and turndown part **(8)** of said inner frame cover being covered onto a cylindrical shaped inner frame **(1)**; a disposable plastic radiation-permeable sheet **(14)** covering the upper side of said inner frame cover and a cylindrical shaped outer frame **(15)** fitted onto the upper side of said inner frame cover over said radiation sheet **(14)**; said sample cell being characterized in that a sample to be analyzed by X-ray analysis only contacts the disposable inner frame cover **(5)** and the disposable radiation-permeable sheet **(14)** so that such disposable parts can be discarded after each analysis and replaced by clean disposable parts, thereby avoiding the necessity of washing the sample cell.

4,037,110

YTTRIUM INDIUM PHOSPHATE X-RAY PHOSPHORS, METHOD OF PREPARATION AND X-RAY INTENSIFYING SCREEN CONTAINING SAME

Francis N. Shaffer, Towanda, and James E. Mathers, Ulster, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,500
Int. Cl.² C09K *11/46*
U.S. Cl. 250—483 **8 Claims**

1. An X-ray phosphor composition consisting essentially of a material having the formula:

$$Y_{1-x}In_xPO_4$$

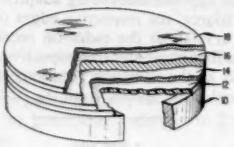
wherein X has a value of from about 0.005 to about 0.2.

4,037,111

MASK STRUCTURES FOR X-RAY LITHOGRAPHY

Gerald Allan Coquin; Juan Ramon Maldonado, both of Berkeley Heights; Dan Maydan, Short Hills, and Sasson Roger Somekh, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 8, 1976, Ser. No. 693,939
Int. Cl.² B01J *17/00*; G02B *5/00*; G21F *5/04*
U.S. Cl. 250—505 **22 Claims**



1. A mask structure for X-ray lithography comprising a dimensionally stable support member, an X-ray-transparent film stretched over and bonded to said support member, and means including stress-compensating constituents for forming a very-low-stress X-ray-absorptive pattern on said substrate.

4,037,112

APPARATUS FOR CROSSLINKING ULTRAVIOLET LIGHT CURABLE COATINGS

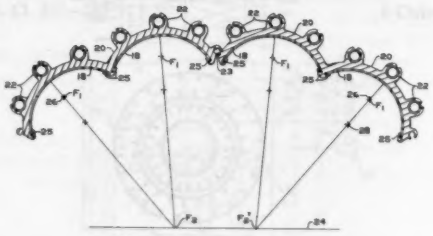
Warren J. Ramler, Elmhurst, and James K. Lackore, Joliet, both of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1975, Ser. No. 561,747
Int. Cl.² B01K *1/00*
U.S. Cl. 250—527 **7 Claims**

1. In an ultraviolet light processor for exposing substrates coated with an ultraviolet light curable coating composition to ultraviolet light to cure said coating, said ultraviolet light processor having a substantially symmetrical reflector comprising four substantially elliptical cylindrical reflectors for reflecting ultraviolet light from four generally linear parallel sources of ultraviolet light located at the first foci of said reflectors to the second foci thereof, wherein:

a. said reflector system has a plane of symmetry generally parallel to said four generally parallel first foci;
b. said second foci are more remotely located from said reflectors than said first foci;
c. the second foci of two of said reflectors are superimposed to form a first common focus;

d. the second foci of the other two of said reflectors are superimposed to form a second common focus;
e. said common foci are located in a plane perpendicular to said plane of symmetry;
f. said common foci are spaced apart by a distance in the range of from about 10 percent to about 50 percent of the distance between the two extreme first foci;



g. the eccectricity of said substantially elliptical cylindrical reflectors is in the range of from 0.2 to about 0.9;
the improvement comprising means for passing said coated substrate under said reflector system in an average direction which is generally parallel to said first foci such that the mean position of said coating is located more remotely from said reflectors than said plane containing said common foci.

4,037,113

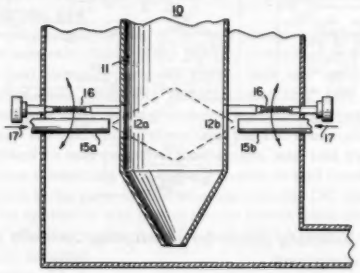
FLAME DETECTOR

William J. Moore, Dallas, Tex., assignor to Forney Engineering Company, Carrollton, Tex.

Continuation of Ser. No. 567,450, April 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 451,636, March 15, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,477

Int. Cl.[2] G01N *21/58*

U.S. Cl. 250—554 **6 Claims**



1. A flame detector device for a boiler furnace comprising:
a movable mounted burner;
a radiation sensitive means outside of said furnace and responsive when energized by incident radiation of a selected energy band width to produce a signal indicative of the existence of a flame;
a lens of quartz material;
a lens housing supporting said lens, said lens housing being connected with said burner so that said lens is focused on the combustion zone of said burner;
a flexible tube connected at one end to said housing and at the other end to said radiation sensitive means;
and a fiber optics bundle extending through said flexible tube for conveying the collected radiation from said lens to said radiation sensitive means, said fiber optics bundle comprising fibers of extruded unclad quartz material capable of conveying radiation without significant loss thereof.

4,037,114

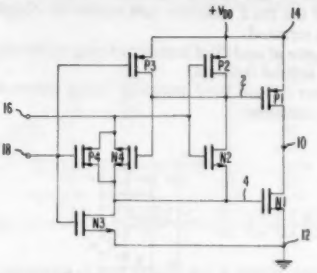
TRI-STATE LOGIC CIRCUIT

Roger Green Stewart, Neshanic Station, and Marceano Seixo de Melo Paulino, Bound Brook, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,038

Int. Cl.[2] H03K *19/08, 19/38*

U.S. Cl. 307—205 **5 Claims**



1. In combination:
first and second points for the application therebetween of an operating potential;
first and second transistors of first and second conductivity type, respectively, each transistor having a conduction path and a control electrode; means connecting their conduction paths in series between said first and second points;
an output terminal connection between the conduction paths of said first and second transistors;
a data input terminal, and a control input terminal;
third and fourth transistors of said first conductivity type having their conduction paths connected in parallel between the control electrode of said first transistor and said first point;
fifth and sixth transistors of said second conductivity type having their conduction paths connected in series between the control electrode of said first transistor and said second point; means connecting the control electrode of said second transistor to the junction of the conduction paths of said fifth and sixth transistors;
means connecting the control electrodes of said third and fifth transistors to said control input terminal;
means connecting the control electrodes of said fourth and sixth transistors to said data input terminal; and
a seventh transistor of said second conductivity type having its conduction path connected between the control electrode of said second transistor and said control input terminal; and
means connecting the control electrode of said seventh transistor to the control electrode of said first transistor.

4,037,115

BIPOLAR SWITCHING TRANSISTOR USING A SCHOTTKY DIODE CLAMP

Charles Meng-Yuan Lee, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 25, 1976, Ser. No. 699,950

Int. Cl.[2] H03K *19/40, 5/08*

U.S. Cl. 307—214 **2 Claims**

1. A circuit arrangement comprising
a first terminal to be maintained at a reference potential,
a second terminal to be maintained at an operating potential,
an input terminal to be supplied with an input signal,
an output terminal at which an output signal will be developed,
a first junction transistor,
means for coupling the input terminal to the base of the first transistor,
a first and a second Shottky diode connected back-to-back between the collector and base of the first transistor,

means for resistively coupling the node between said two diodes to the second terminal,

a second and a third junction transistor,

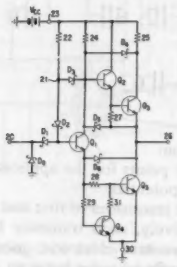
the base of said second transistor connected to the collector of the first transistor and resistively coupled to the second terminal,

the collector of said second transistor connected to the second terminal,

the emitter of said second transistor being connected to the base of the third transistor and resistively coupled to the output terminal,

the collector of said third transistor being resistively coupled to the second terminal,

the emitter of said third transistor being connected to the output terminal,



a third Schottky diode having its anode connected to the base of the second transistor and its cathode to the collector of the third transistor,

a fourth Schottky transistor having its base resistively coupled to the emitter of the first transistor, its emitter connected to the first terminal,

a fifth junction transistor having its emitter connected to the first terminal, its collector connected to the output terminal, and its base resistively coupled to the collector of the fourth transistor and resistively coupled to the emitter of the first transistor,

and a fourth Schottky diode having its anode connected to the emitter of the first transistor and its cathode to the output terminal whereby it is resistively connected between the collector and base of the fifth transistor.

4,037,116

UP/DOWN SWITCH AND SWITCHING SIGNAL GENERATOR

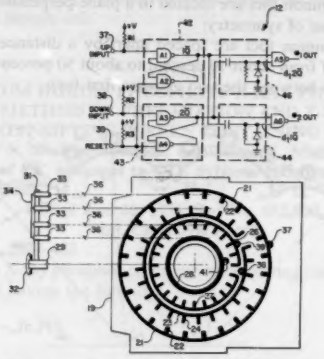
Takuo Hodama, Watsonville, Calif., assignor to SBE Incorporated, Watsonville, Calif.

Filed Aug. 16, 1976, Ser. No. 715,130

Int. Cl.[2] H03K *17/18;* **H01H** *19/58*

U.S. Cl. 307—247 A **10 Claims**

1. An electromechanical switch for selective switching in first and second opposing directions comprising a switch actuating member for manual engagement, a plurality of switch contacts mounted for movement by said switch actuating member, a plurality of matching switch contacts being disposed for electrical contact with ones of said switch contacts in first and second predetermined sequence in accordance with the first and second opposing direction selection, said matching switch contacts providing a first direction advance signal, a second direction advance signal and a reset signal when in electrical contact with said ones of said switch contacts, first and second latches coupled to receive said first and second direction advance signals respectively and said reset signal, and providing first and second latch outputs responsive thereto, first and second gates coupled to each receive said first and second latch outputs, said first gate providing a first switch output with said second gate being disabled when said first predetermined sequence of switch contact occurs, and said second gate providing a second switch output with said first gate being disabled when said second predetermined sequence



of switch contact occurs, said first and second latches being reset by said reset signal.

4,037,117

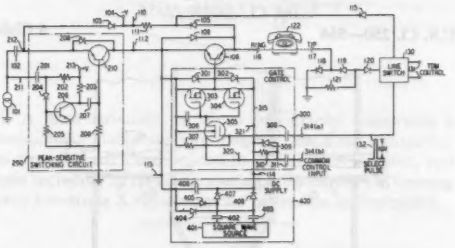
PEAK SHUT-OFF ELECTRONIC SWITCH

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 15, 1976, Ser. No. 666,793

Int. Cl.[2] H03K *17/72*

U.S. Cl. 307—252 N **18 Claims**



1. A switching circuit for interrupting cyclically varying signals comprising

at least one first switching device connected in series with a second switching device each first and second switching device having at least first, second and third terminals, the first terminal of each first switching device connected to the second terminal of the second switching device, each first switching device conducting an electric current in one direction along an internal electrical path between its first and second terminals which electrical conduction is initiated by application of enabling signals to the third terminal and discontinued by application of disabling signals to the third terminal when the electric current flowing through the internal electrical path is below a predetermined level, and

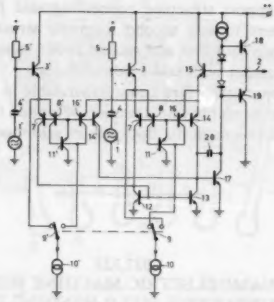
a circuit for periodically opening the second switching device during a fraction of a cycle of preselected polarity of the cylically varying signals to ensure discontinuation of the electric current flowing through the first switching device in response to the disabling signals.

4,037,118

CIRCUIT ARRANGEMENT FOR ELECTRONICALLY APPLYING AN ALTERNATING VOLTAGE

Gunter Sieborger; Ernst August Kilian, and Gerhard Jonkuhn, all of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,513
Claims priority, application Germany, Feb. 13, 1975, 2506034
Int. Cl.[2] H03K *17/16, 17/60*
U.S. Cl. 307—255 6 Claims



1. A circuit arrangement for selectably connecting at least one AC input source to a common output point, which comprises:

input circuit means connected to said AC input source for providing an AC output signal proportional thereto and a DC bias signal;

a DC control current source;

output circuit means for providing said common output point;

damping network means connected between said input circuit means and said output circuit means for selectably connecting said AC output signal to said output circuit means while maintaining said DC bias signal substantially constant; and

switching means having active and passive switching states for selectably connecting the DC control current source to said damping network means and said input circuit means, said switching means connecting said current source to said damping means when in the active state to cause the AC output signal and the DC bias signal to be applied to said output circuit means, and said switching means connecting said current source to said input circuit means in the passive state to cause only the DC bias signal to be applied to said output circuit means while the damping network means maintains said DC bias signal substantially constant.

4,037,119

CHARGE TRANSFER DELAY CIRCUIT FOR ANALOG SIGNALS

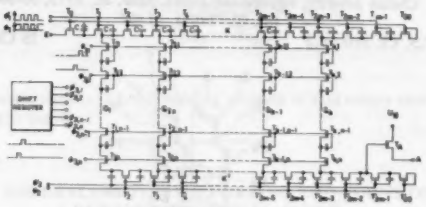
Hermannus Schat, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed June 18, 1975, Ser. No. 588,072
Claims priority, application Germany, June 25, 1974, 2430349
Int. Cl.[2] H03K *5/13;* G11C *19/00;* H03K *3/353*
U.S. Cl. 307—293 4 Claims

1. A charge transfer delay circuit for delaying analog signals wherein there is provided a first longitudinal chain (K) of series-connected indentical stages operated in such a way that in a first clock phase, the even-numbered stages, switched by a first clock signal, contain an analog signal voltage value, while the odd-numbered stages, switched by a second clock signal, contain a neutral voltage value, whereas during the following clock phase, the odd-numbered stages contain an analog signal voltage value and the even-numbered stages contain a neutral voltage value comprising:

a plurality of transversal chains (Q_1, Q_{2n}, Q_{k-1}, Q_k) each comprising an identical number (n) of series-connected stages, each of said plurality of transversal chains connected to a different alternate stage of said first longitudinal chain;

an *n* stage shift register for generating and applying *n* auxiliary clock signal ($\phi_{3,1}$, $\phi_{3,2}$, $\phi_{3,n-1}$, $\phi_{3,n}$), one to each of the *n* stages of said plurality of transversal chains, all stages in



the transversal chains occupying a similar position in its respective chain being coupled to the same stage of said n-stage shift register, for activating the *n* stages of said first plurality of transversal chains, one at a time in turn;

a second longitudinal chain (K') of series-arranged identical stages, alternate stages of which are coupled to a different one of said plurality of transversal chains; and

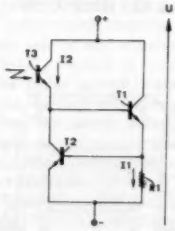
means for applying a third clock signal to the even stages of said second longitudinal chain and a fourth clock signal to the odd numbered stages of said second longitudinal chain.

4,037,120

ELECTRONIC DIPOLE FOR LOOPING A TELEPHONE LINE

Joel Serge Colardelle, Creteil; Marie Helene Comte, Jouy-en-Josas, and Claude Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,763
Claims priority, application France, June 27, 1975, 75.20202
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—311 2 Claims



1. An electronic dipole for the looping of a telephone line, operating at constant current even for low voltages applied to its terminals, including a first transistor whose collector is connected directly to a first terminal of the line and whose emitter is connected to the second terminal of the line through a resistor, and a second transistor whose collector and base are connected respectively to the base and emitter of the first transistor and whose emitter is connected to the second terminal of the line, and wherein a circuit through which a constant current flows is coupled between the collector and the base of the first transistor, wherein the said circuit allowing a constant current to flow consists of a phototransistor having an emitter, a base and a collector electrode and controlled by electroluminescent diode, and wherein a resistor is placed between the emitter of the phototransistor and the base of the first transis-

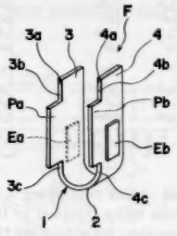
tor, and wherein a capacitor is placed between the base of the phototransistor and the base of the first transistor.

4,037,121

PIEZOELECTRICALLY DRIVEN TUNING FORK WITH HARMONIC SUPPRESSION

Takeshi Nakamura, and Hiroshi Nishiyama, both of Hakui, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 26, 1976, Ser. No. 670,955
Claims priority, application Japan, Mar. 31, 1975, 50-39663
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—8.2 **25 Claims**



1. An electrically driven tuning fork for use in electrical and electronic equipment which comprises a tuning fork vibrator having two prongs and electrical elements applied to said prongs for driving said tuning fork vibrator, said prongs having inner and outer surfaces defined between side edges thereof;

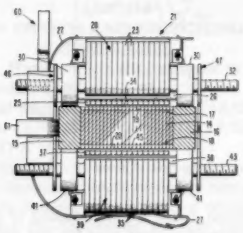
said tuning fork vibrator including projections formed on said prongs and extending over substantially the length of said prongs, except over node portions of fundamental harmonic oscillation thereof, said projections acting to stiffen said prongs so as to suppress higher harmonic oscillation in said tuning fork vibrator.

4,037,122

LINEAR ACTUATOR

Gilbert Belmont Bonner, and Joseph Leo Dessel, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1976, Ser. No. 691,931
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—14 **6 Claims**



1. A linear actuator comprising in combination

an elongate magnetic motor bar having parallel guide surfaces,

a motor element inductively co-operable with said motor bar to produce relative motion therebetween in the direction of the longitudinal axis of said motor bar,

said motor element comprising

a first magnetic structure inductively co-operable with said motor bar to cause said relative motion,

first roller means attached to said first magnetic structure,

said first roller means engaging a first of said guide surfaces during said relative motion and maintaining a fixed air gap between said first magnetic structure and said guide surface,

a second magnetic structure inductively co-operable with said motor bar to cause said relative motion jointly with said first magnetic structure,

second roller means attached to said second magnetic structure,

said second roller means engaging a second of said guide surfaces during said relative motion and maintaining a fixed air gap between said second magnetic structure and said second guide surface,

and a support structure connecting said first magnetic structure to said second magnetic structure so as to maintain said first and second roller means in continuous contact with said guide surfaces,

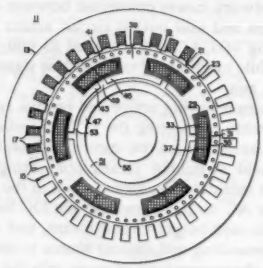
said support structure being expandable in the direction perpendicular to said direction of motion to compensate for variations in the thickness of said motor bar.

4,037,123

DYNAMOELECTRIC MACHINE WITH A SUPERCONDUCTIVE FIELD WINDING THAT CAN OPERATE IN EITHER A SYNCHRONOUS OR AN ASYNCHRONOUS MODE

Cecil J. Mole, Monroeville, and Henry E. Haller, III, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 327,520, Jan. 29, 1973, Pat. No. T925,001. This application July 17, 1975, Ser. No. 596,776
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—52 **12 Claims**



1. In a dynamoelectric machine having an armature and a field structure mounted for relative motion therebetween, an improved field structure comprising:

conductors spaced from the armature;

a plurality of first portions of ferromagnetic material;

a superconductive winding wound about said first portions of ferromagnetic material to form a plurality of magnetic poles;

insulating means thermally isolating said superconductive winding from said poles and from ambient conditions;

second portions of ferromagnetic material positioned between said superconductive winding and said conductors and interconnecting adjacent pairs of said poles to provide a first magnetic flux path therebetween;

third portions of ferromagnetic material forming a second magnetic flux path between adjacent pairs of said poles on the side of said superconductive winding away from said conductors; and

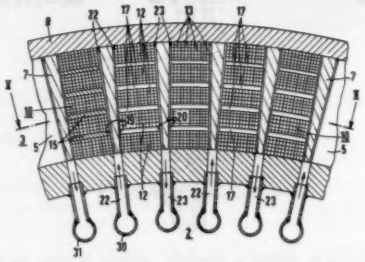
an area of nonferromagnetic material located in said second magnetic flux path.

4,037,124

COOLING ARRANGEMENT FOR THE ROTOR OF AN ELECTRIC MACHINE

Dieter Kullmann, Langenzenn; Peter Henninger, Erlangen, and Lutz Intichar, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 18, 1975, Ser. No. 605,536
Claims priority, application Germany, Aug. 21, 1974, 2440132
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—52 12 Claims



1. In a cooling arrangement for the forced cooling of the rotor of an electric machine both during standstill and rotation, which rotor has a plurality of longitudinal slots each having disposed therein a winding section of a superconductive excitation winding which is to be cooled to a superconducting temperature, each winding section being provided with at least one coolant feed line and one associated coolant discharge line, the coolant feed and discharge lines being connected to corresponding supply and collection lines which extend through the interior space enclosed by the excitation winding, the improvement comprising:

a. the coolant feed lines and coolant discharge lines comprising a multiplicity of at least approximately radially extending coolant feed lines and coolant discharge lines incrementally spaced over the entire axial length of each winding section, each coolant discharge line circumferentially separated from its associated coolant feed line; and

b. means forming at least one cooling canal between each coolant feed line and its associated coolant discharge line extending at least approximately in the circumferential direction of the rotor, said means separating said cooling canals such that there is no direct connection to the cooling canals extending between neighboring axially spaced coolant feed lines and discharge lines.

4,037,125

SMALL-SIZED DIRECT CURRENT ROTARY ELECTRIC APPLIANCE

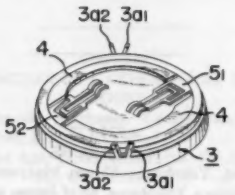
Kanemasa Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 7, 1975, Ser. No. 620,380
Claims priority, application Japan, Oct. 11, 1974, 49-116978
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—248 6 Claims

1. A brush for use in a small-sized, direct current rotary electric machine, comprising:

a. a first thin, planar elastic member made of an electrically conductive material formed in a substantially elongated U-shape of narrow width, and having a contact portion formed at the open end thereof arranged to be in contact with a commutator in said rotary electric machine; and

b. a second thin, planar elastic member made of an electrically conductive material in a substantially elongated U-shape having a width broader than the width of said first elastic member, the open end part of which is flexibly connected to said first elastic member at the center side portions of said first elastic member so that same may pivotally swing like a balancing toy with respect to the open end part of said second elastic member, the other end of said second elastic member being arranged to be fixedly



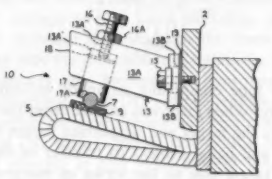
maintained at a brush holding position of said rotary electric machine.

4,037,126

TIELESS BRACING FOR SUPPORTING END TURNS OF A DYNAMOELECTRIC MACHINE

Thomas E. Brennan, Voorheesville; Robert H. Hartmann, Gansevoort, and Robert M. McCoy, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,601
Int. Cl.[2] H02K *3/46*
U.S. Cl. 310—260 13 Claims



1. Tieless bracing means for winding end turns of a dynamoelectric machine comprising a radially expandable and contractable split metal annulus, spreader means mounted on said annulus, said spreader means being operable to hold the ends of said annulus in a predetermined spaced relationship with one another, a ring of compressible material positioned in engagement with the inner side of said annulus around substantially the entire circumference thereof, in combination with a dynamoelectric machine frame having a stator mounted therein with insulated stator winding end turns extending beyond the ends of the stator core laminations, and a plurality of adjustable annulus-positioning means mounted on said frame at angularly spaced points radially outward from the end turns, each of said positioning means comprising:

a. a generally T-shaped bracket mounted on the frame with the trunk of the bracket generally parallel to the closest stator winding end turns and spaced therefrom, said trunk of the bracket including first wall means defining a cup-shaped recess in the side of the bracket closest to the stator winding ends, and second wall means defining a threaded aperture extending through the bracket from the bottom of said recess to the radially outermost side of the bracket, and a threaded bolt rotatably threaded into said threaded aperture with the head of the bolt projecting from the outer surface of the bracket,

b. a dowel having a transverse groove across its inner face slidably mounted within the cup-shaped recess, said transverse groove being positioned to partially encompass an outer surface portion of said metal annulus to hold it against said ring of compressible material, and

c. fastening means mounted on each threaded bolt to secure it in a desired operating position after the respective bolts have been rotated to force their inner ends against the

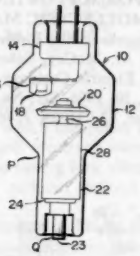
dowels associated therewith to locate the annulus in a desired predetermined position with respect to the stator winding end turns.

4,037,127

X-RAY TUBE

Shinichi Kawai, Yokohama; Shigeo Maeyama, Fujisawa, and Tokihiko Shidara, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 30, 1976, Ser. No. 746,061
Claims priority, application Japan, Dec. 5, 1975, 50-164294[U]
Int. Cl.[2] H01J *35/04*
U.S. Cl. 313—60 **8 Claims**



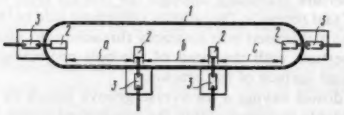
1. An X-ray tube comprising an anode including a target giving off X-rays when electrons emitted from the filament of a cathode strike the target and supporting means for supporting the target and being subject to transfer of the heat produced on the target due to the strike of electrons thereon, wherein black chromium plating is applied to the anode except the electron striking surface of the target.

4,037,128

THREE-PHASE DISCHARGE LAMP

Izrail Aronovich Levin, 16 Parkovaya ulitsa 55, korpus 2, kv. 43; Jury Pavlovich Potemkin, ulitsa Ljublinskaya 17, stroenie 3, kv. 32; Igor Pavlovich Slobodskoi, Pechatnikov pereulok 13, kv. 28; Alexandr Mikhailovich Troitsky, Tsvetnoi bulvar 22, kv. 64, and Ivan Vasilievich Sapozhnikov, ulitsa Baikalskaya 42, korpus 2, kv. 22, all of Moscow, U.S.S.R.

Filed Sept. 12, 1975, Ser. No. 612,919
Int. Cl.[2] H01J *61/06*
U.S. Cl. 313—188 **26 Claims**



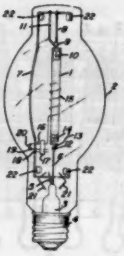
1. A three-phase discharge lamp, comprising: a bulb having a longitudinal axis; inert gas filling said bulb; four main electrodes fastened in said bulb; three discharge gaps formed by said four main electrodes, said discharge gaps, disposed in sequence along said axis of said bulb.

4,037,129

HIGH PRESSURE SODIUM VAPOR LAMP HAVING LOW STARTING VOLTAGE

Alexander T. Zack, Danvers, and John J. Gutta, Salem, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 10, 1976, Ser. No. 665,479
Int. Cl.[2] H01J *65/00*
U.S. Cl. 313—201 **4 Claims**



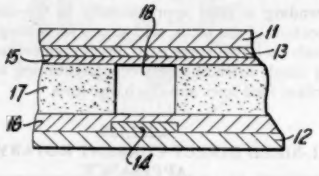
1. In a high pressure arc discharge lamp comprising an arc tube disposed within an outer jacket, the arc tube having an electrode at each end, the improvement which comprises a multiple turn wire starting aid coiled around the arc tube intermediate the electrodes and electrically connected to only one of the electrodes, the coiled starting aid extending longitudinally along the arc tube a distance that is at least 10 % of the arc length.

4,037,130

GAS DISCHARGE DISPLAY DEVICE

Takao Mimitsuka, and Tunekiyo Iwakawa, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,211
Claims priority, application Japan, May 21, 1974, 49-56872
Int. Cl.[2] H01J *61/30*
U.S. Cl. 313—220 **5 Claims**



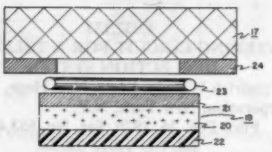
1. A gas discharge display device comprising:
a pair of insulating plates spaced from each other in substantially parallel relation, each of said plates having an inside surface facing that of the other plate and at least one of said plates being transparent;
a first group of at least one electrode disposed on the inside surface of one of said insulating plates, a second group of at least one electrode disposed on the inside surface of the other of said insulating plates, said first and second groups of electrodes being disposed traverse to each other to form a uniform discharge gap;
a first dielectric layer covering said first group of electrodes and a second dielectric layer covering said second group of electrodes;
a thin flat member disposed between said insulating plates to give said substantially parallel relation therebetween, said member being made entirely of a porous dielectric material and having an aperture of a shape substantially identical to said discharge gap; and
an ionizable gas filling said discharge gap.

4,037,131

RETINA FOR PYROELECTRIC VIDICON

Wellman L. Clark, Springfield; John T. Cox, Alexandria; Gerald Klauber, Fredericksburg; Ferdinand C. Petito; John B. Ramsey, Jr., both of Alexandria, and John E. Waylonis, Fairfax Station, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 7, 1976, Ser. No. 647,271
Int. Cl.[2] H01J *31/49, 29/45*
U.S. Cl. 313—388 **4 Claims**



1. In an optical system, wherein a wafer of pyroelectric material chosen from the group comprising Triglycine Sulphate, Triglycine Tetrafluoroberyllate, Deuterated Triglycine Tetrafluoroberyllate, Lithium Tantallate, Lithium Niobate, and Lead Lanthanum Ziroconate is coated on one broad side with a thin layer of conductive material and an electronic means coupled to said thin layer is provided to scan the remaining broad side of said wafer with an electron beam whereby a thermal image induced on said one side is detected; the improvement comprising:

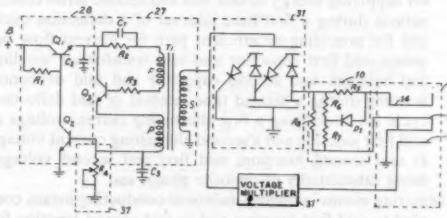
a layer of dielectric material on said remaining side of said wafer having a secondary emission coefficient greater than one and a sheet resistance greater than 10^{12} ohm/-square.

4,037,132

IMAGE TUBE POWER SUPPLY

Alan W. Hoover, Hollins, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 6, 1976, Ser. No. 646,799
Int. Cl.[2] H01J *31/26*
U.S. Cl. 315—10 **4 Claims**



1. A controlled device brightness power supply for image tubes of the type containing a micro-channel plate electron multiplier and a phosphor screen comprising:

oscillator means for providing A.C. power when coupled with a source of D.C. power;

rectifier means coupled with said oscillator for providing D.C. power to the tube;

power sensing means consisting of a resistive element electrically coupled in series between said D.C. power source and said oscillator for detecting changes in tube operating power corresponding to changes in the tube input illumination and reducing the microchannel plate electron multiplier voltage to provide a constant illumination at the phosphor screen; and

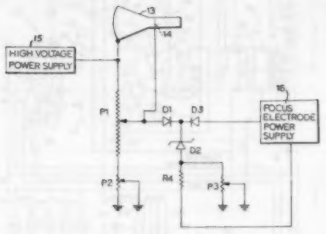
control circuit means electrically coupled with the power sensor and oscillator in feed-back relation for controlling the A.C. power in repsonse to the changes in the tube operating power consisting of at least one transistor electrically coupled between the oscillator and the D.C. power source to control the conduction through the oscillator.

4,037,133

COMPENSATION OF CATHODE RAY TUBE FOR MOIRE

John Joseph Sennik, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Apr. 12, 1976, Ser. No. 676,307
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—31 TV **4 Claims**



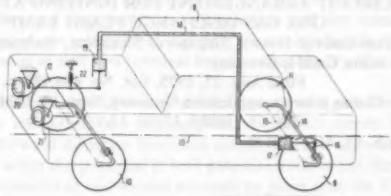
1. In a video signal receiving apparatus of a type having a cathode ray tube with a focus electrode, and means for supplying a DC voltage to said focus electrode, said DC voltage varying in response to changes in the beam current of said cathode ray tube in a direction to maintain the electron beam of said cathode ray tube focused, the improvement comprising means responsive to said DC voltage reaching a critical level where a further increase thereof will result in moire for maintaining said DC voltage below said critical level despite any additional changes in said beam current tending to increase said DC voltage above said critical level.

4,037,134

INSTALLATION FOR AUTOMATIC CONTROL OF THE LIGHT DISTANCE WITH MOTOR VEHICLE HEADLIGHTS

Bernd Löper, Korb, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 19, 1975, Ser. No. 642,569
Claims priority, application Germany, Dec. 20, 1974, 2460426
Int. Cl.[2] B60Q *1/12*
U.S. Cl. 315—78 **12 Claims**



1. An installation for automatically controlling motor vehicle headlights in dependence on the positional changes of the vehicle body of a motor vehicle, comprising detection means for detecting a one-sided positional change of the vehicle body, and control means responsive to said detection means for controlling the light projection distance of the headlights, when driving through a curve resulting in a one-sided positional change of the vehicle body, in such a manner that when driving through a curve located on the outside in relation to the oppositely directed traffic, the light projection distance is

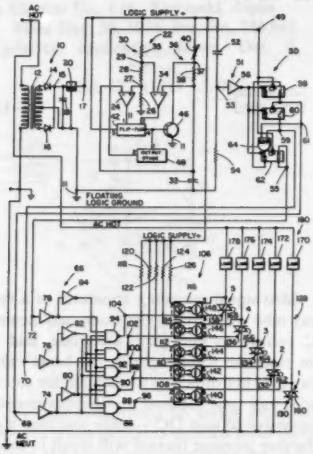
decreased and when driving through a curve located on the inside in relation to the oppositely directed traffic, the light projection distance is increased.

4,037,135

SOLID STATE TIMER-STEPPER WITH SOFT SWITCH-ON AND SWITCH-OFF LOAD CONTROL

William E. Novey, Newhall, Calif., assignor to Eli Bridge Company, Jacksonville, Ill.

Filed June 3, 1976, Ser. No. 692,279
Int. Cl.[2] G05F *1/00*; H05B *37/02, 39/02*
U.S. Cl. 315—194 **5 Claims**



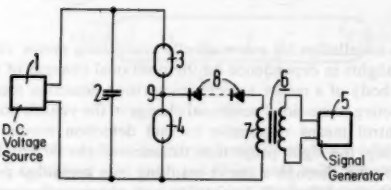
1. In a solid-state timer-stepper of the class wherein a pulse generator provides a train of incoming pulses to a counter which puts out BCD signals to a decoder for conversion into a digital format suitable for sequentially switching triacs arranged in multiple-segment load circuits, the combination with the gate circuits of said triacs of phase-shift network means having inputs electrically connected to the output from said decoder and outputs electrically connected to the gate circuits of said triacs for gating said triacs at increasing phase angles after application of the output from the decoder, and decreasing phase angles after removal of the output therefrom; whereby soft switching of the triacs is simulated.

4,037,136

CIRCUIT ARRANGEMENT FOR IGNITING AT LEAST ONE GAS DISCHARGE FLASH LAMP

Ernst-Ludwig Hoene, Singapore, Singapore, assignor to Heimann GmbH, Germany

Filed Aug. 27, 1975, Ser. No. 608,158
Claims priority, application Germany, Sept. 19, 1974, 2444893
Int. Cl.[2] H05B *37/00, 37/00, 41/14*
U.S. Cl. 315—241 P **2 Claims**



1. A flash arrangement comprising:

at least one first gas discharge flash lamp;

a flash capacitor;

a voltage source connected to charge said flash capacitor;

an electronic switch comprising a second flash lamp connected in series with said first flash lamp;

the series combination connected across said flash capacitor, said second flash lamp including a gas discharge path, each of said flash lamps comprising only main electrodes, a main electrode of each flash lamp connected to a main electrode of the other flash lamp to define a junction; and

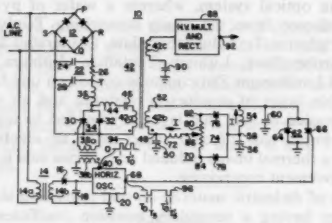
an ignition pulse generator connected to the junction of the two interconnected main electrodes.

4,037,137

CENTERING CIRCUIT FOR A TELEVISION DEFLECTION SYSTEM

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,400
Int. Cl.[2] H01J *29/54*
U.S. Cl. 315—398 **6 Claims**



1. A deflection system including a centering circuit, comprising:

a first series combination comprising a transformer winding and a first capacitor and having a first junction therebetween;

a second series combination comprising a deflection winding and a second capacitor and having a second junction therebetween;

means coupled to said first and second series combinations for supplying energy to said first and second series combinations during a first time interval of a deflection cycle and for providing an efficient path for current flow between said first capacitor and said transformer winding and between said second capacitor and said deflection winding during a second time interval of said deflection cycle for developing a first alternating current voltage at said first junction and a second alternating current voltage at said second junction, said first and second voltages being substantially of opposite phase; and

centering means including unilateral conducting means coupled to said first junction and to said second junction for rectifying the difference between said first and second voltages for providing the sole source for a predetermined polarity and magnitude of average current flow through said deflection winding during said deflection cycle.

4,037,138

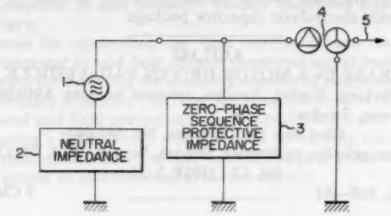
ZERO-PHASE SEQUENCE PROTECTIVE DEVICE FOR FAULTS WITHIN ARMATURE OF THREE-PHASE SYNCHRONOUS MACHINE

Koreyasu Kobayashi, Tagajyo, Japan, assignor to Koreyasu Kobayashi, Japan

Filed Oct. 1, 1975, Ser. No. 618,559
Claims priority, application Japan, Oct. 3, 1974, 49-114374
Int. Cl.[2] H02H *7/08*
U.S. Cl. 317—13 R **5 Claims**

1. In a three-phase electrical power system, a three-phase

synchronous machine having three Y-connected armature windings interconnected at a common point, and a neutral impedance coupling said common point to a neutral point, said windings being connected to corresponding phases of said system; and three protective impedance elements, each element being connected between said neutral point and a corresponding phase of said system, each of said impedance ele-



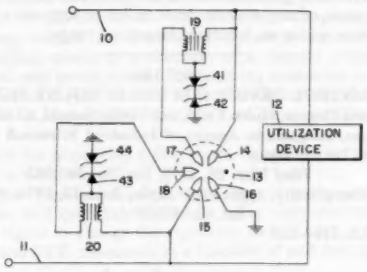
ments having a value such that for each particular phase of said system the values of (i) the zero-phase symmetrical component sequence impedance of the particular armature winding associated with said particular phase, (ii) said neutral impedance, and (iii) the impedance of the protective impedance element connected to said particular phase, combine to provide a series resonant circuit and to exhibit parallel resonance to any fault from said particular armature winding to said neutral point.

4,037,139

LIGHTNING ARRESTER

Roy I. Crask, Edina, and William D. Egerer, Minneapolis, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed Mar. 17, 1975, Ser. No. 558,670
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—58 **10 Claims**



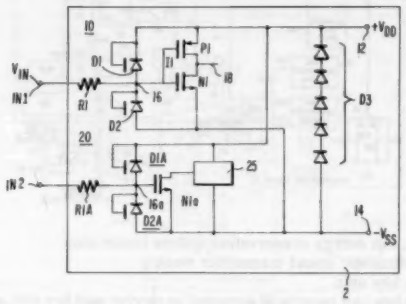
1. For a lightning protector for a pair of electrical signal lines coupled to a utilization device, in combination: a gas-filled discharge tube having five electrodes, one of said electrodes adapted for electrical connection to one of said signal lines, another of said electrodes adapted for electrical connection to the other of said signal lines, and a third electrode being electrically grounded; a first step-up transformer having one end of its primary connected to said one electrode and one end of its secondary connected to a fourth electrode and the other end of its secondary and primary connected only to a reference potential level; and another step-up transformer having one end of its primary connected to said another electrode and one end of its secondary connected to a fifth electrode and the other end of its primary and secondary connected only to a reference potential level other than electrical ground.

4,037,140

PROTECTION CIRCUIT FOR INSULATED-GATE FIELD-EFFECT TRANSISTORS (IGFETS)

Sargent Sheffield Eaton, Jr., Phillipsburg, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,808
Int. Cl.[2] H02H *3/20*
U.S. Cl. 361—56 **10 Claims**



1. For use with an insulated-gate field-effect transistor (IGFET) having first and second regions defining the ends of a conduction channel and having a gate electrode insulated from and overlying said conduction channel, a protection circuit comprising:

first and second terminals for the application of an operating potential therebetween;

means coupling said first region to said first terminal and means coupling said second region to said second terminal;

first and second diodes and a diode means each of said diodes and diode means having a forward voltage drop (V_F) when conducting current in the forward direction and having a reverse breakdown voltage drop (V_R) when conducting current in the reverse direction, wherein the V_F of each one of said diodes and diode means is significantly less than its V_R, and

wherein the V_R of said first and second diodes is greater than the V_R of said diode means plus the V_F of one said first and second diodes;

means connecting said first diode between said gate electrode and said first terminal poled to conduct current in the forward direction from said gate into said first terminal when the potential at said gate electrode exceeds the potential at said first terminal by more than the V_F of said first diode;

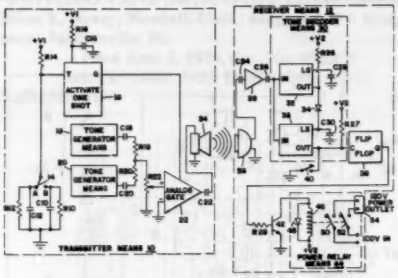
means connecting said second diode between said gate electrode and said second terminal poled to conduct current in the forward direction from said second terminal into said gate when the potential at said gate electrode is less than the potential at said second terminal by more than the V_F of said second diode; and

means connecting said diode means between said first and second terminals for conducting current in the forward direction from said second terminal into said first terminal when the potential at said second terminal exceeds the potential at said first terminal by more than the V_F of said diode means and for conducting current in the reverse direction from said first terminal to said second terminal when the potential at said first terminal exceeds the potential at said second terminal by more than the V_R of said diode means.

4,037,141
ENERGY CONSERVATION SYSTEM

Robert L. Fichtner, Livermore, Calif., assignor to Select Energy Systems, Inc., Moraga, Calif.

Filed July 1, 1976, Ser. No. 701,533
Int. Cl.[2] H01H 47/20
U.S. Cl. 361—182 14 Claims

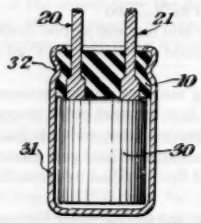


1. An energy conservation system comprising:
ultrasonic sound transmitter means;
a key unit;
a key unit receptacle arranged to receive said key unit and to signal said ultrasonic sound transmitter means upon said initial insertion of said key unit into said receptacle, said transmitter acting in response thereto to output a sound signal having a plurality of frequency tones therein;
power outlet means; and
ultrasonic sound receiver means including means for controlling the coupling of power to said power outlet means, said receiver means, upon sensing said output sound signal of said transmitter means, acting in response thereto to couple power to said power outlet means.

4,037,142
ELECTROLYTIC CAPACITOR PACKAGE HAVING A GROMMET WITH TAPERED LEAD HOLES

Ralph B. Poole, Hillsville, Va., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 29, 1976, Ser. No. 653,563
Int. Cl.[2] H01G 9/00
U.S. Cl. 361—433 7 Claims

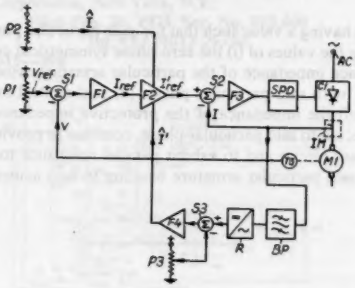


1. A sealed electrolytic capacitor package comprising:
an electrolytic capacitor section;
a metal housing containing said capacitor section and having an open end;
an elastomeric grommet being mounted in and sealed to said open end of said housing, said grommet having in the unstressed condition at least two round tapered holes therein extending from the inner face to the outer face of said grommet, the largest diameter of each said tapered hole being at said inner face;
at least two metal leads, each one of said leads being sealed in one of said at least two holes, respectively, said each one lead having a round middle portion of diameter commensurate with said largest diameter of said one hole, said each one lead having a round wire end portion of fixed diameter smaller than said diameter of said middle lead portion and larger than the unstressed diameter of said one tapered hole at said outer grommet face, the junction of said middle and said wire end lead portions being contained within said one hole, said wire end portion extending outwardly from said grommet and said middle lead portion being connected to said capacitor section to provide electrical access thereto from the outside of said sealed electrolytic capacitor package.

4,037,143
MEANS IN A MOTOR-DRIVEN RAIL-VEHICLE

Bo Söderberg, Koping, Sweden, assignor to Asea Aktiebolag, Vasteras, Sweden

Filed Jan. 14, 1975, Ser. No. 541,041
Claims priority, application Sweden, Sept. 6, 1974, 7411269
Int. Cl.[2] H02P 5/52
U.S. Cl. 318—52 9 Claims

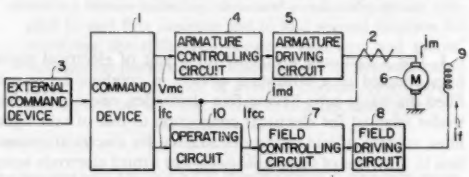


1. In a motor-driven vehicle having at least one drive system which comprises an electric drive motor and drive wheels, an oscillation sensing member which includes means to sense oscillations of an electrical quantity within the frequency range of natural oscillation of the drive system and to form a signal corresponding to the amplitude of said oscillations, means for controlling the torque of said electrical drive motor in response to said signal; and
said control means including means to partially reduce the torque of said electric drive motor in response to oscillations within such natural frequency range.

4,037,144
CONTROL DEVICE FOR USE IN SHUNT MOTOR

Tsutomu Ohmae; Hideo Yano, and Toshio Suzuki, all of Hitachi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 28, 1975, Ser. No. 562,983
Claims priority, application Japan, June 13, 1974, 49-66525
Int. Cl.[2] H02P 5/16
U.S. Cl. 318—338 4 Claims



1. A speed control device for use in a shunt motor comprising:
means for generating an armature command signal pattern to control the speed of said shunt motor, the amplitude of said signal pattern increasing in response to the operating speed of said motor during a first range of operating speeds of said motor and being substantially constant during a second range of operating speeds of said motor;

means for generating a field current command signal pattern to control the speed of said shunt motor, the amplitude of said field current command signal pattern being substantially constant during said first range of operating speeds of said motor and decreasing in response to the operating speed of said motor during said second range of operating speeds of said motor;

means for controlling the armature voltage of said motor in response to said armature voltage command signal pattern;

means for controlling the field current of said motor in response to said field current command signal pattern;

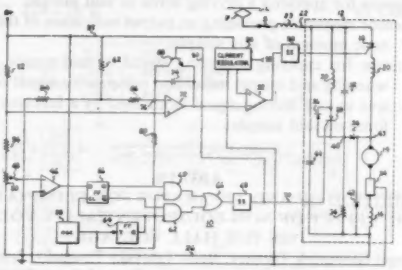
means for detecting the armature current of said motor; and

operating means for receiving the armature current detected and said field current command signal pattern and generating a field current control signal by varying the amplitude of said field current command signal pattern in response to said detected armature current.

4,037,145
MULTIPLE FREQUENCY CHOPPER CONTROL

Ronald Barry Bailey, and Thomas Detlor Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 8, 1975, Ser. No. 638,520
Int. Cl.[2] H02P *5/06*
U.S. Cl. 318—341 **9 Claims**



1. A frequency control system for a chopper circuit including controllable switching means for metering power from a DC source to a DC load, said control system comprising:

a. gating control for controlling the duty factor of the switching means as a function of a current command signal, said gating control means being connected to supply periodic ON and OFF commands to the chopper circuit at a controlled repetition rate for controlling said duty factor;

b. means for generating a first signal representative of current in the load; and

c. means coupling said first signal to said gating control means, said gating control means being responsive to said first signal to change the repetition rate of said periodic ON and OFF commands as a function of said first signal.

4,037,146
OUTPUT SELECTION CONTROL SYSTEM

Yoshihiko Kondo, Nagoya, Japan, assigaor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 27, 1976, Ser. No. 652,854
Claims priority, application Japan, Jan. 29, 1975, 50-12710
Int. Cl.[2] H02P *7/00*
U.S. Cl. 318—444 **5 Claims**

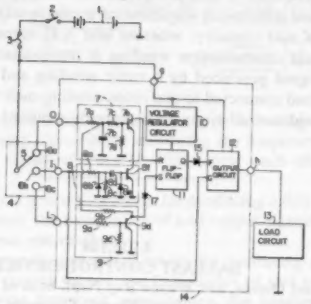
1. An output selection control system comprising:

a d.c. power source (**1**);

an operating switch (**4**) including a movable contact (**5**) connected to said d.c. power source and first, second and third fixed contacts (**6***a*, **6***b*, **6***c*) operatively engageable with said movable contact (**5**), respectively;

a memory circuit (**7**) connected to said first fixed contact (**6***a*) for memorizing that said movable contact (**5**) has been engaged with said first fixed contact (**6***a*), said memory circuit (**7**) including an output terminal;

a trigger circuit (**8**) connected to said second fixed contact (**6***b*) and said memory circuit (**7**) for causing said memory circuit (**7**) to generate a first signal at said output terminal thereof only when said movable contact (**5**) is engaged with said second fixed contact (**6***b*) while said memory circuit (**7**) memorizes that said movable contact (**5**) of said operating switch (**4**) has been engaged with said first fixed contact (**6***a*); and



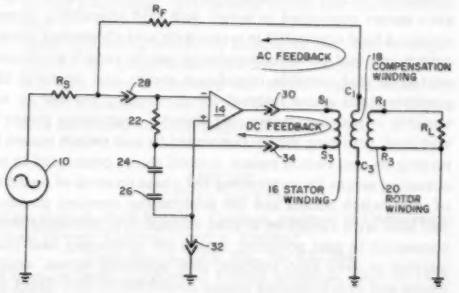
a preference circuit (**9**) connected to said third fixed contact (**6***c*) and said memory circuit (**7**) for clearing the memory stored in said memory circuit (**7**) when said movable contact (**5**) of said operating switch (**4**) is engaged with said third fixed contact (**6***c*), said preference circuit (**9**) having an output terminal;

whereby said memory circuit (**7**) generates at the output terminal thereof a second signal different from said first signal when said movable contact (**5**) is engaged with said second fixed contact (**6***b*) while said memory has been cleared.

4,037,147
ISOLATION AMPLIFIER FOR RESISTIVE AND INDUCTIVE LOADS

Robert Neal Smith, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1976, Ser. No. 661,479
Int. Cl.[2] H02P *7/68*
U.S. Cl. 318—632 **4 Claims**



1. Isolation amplifier circuitry for use with inductive loads comprising:

a. differential amplification means for producing an amplified signal;

b. a stator winding connected to said differential amplification means for producing a flux field which varies with said amplified signal;

c. D.C. feedback resistive means connected to said stator winding for feeding back D.C. potentials from said stator winding to the input of said differential amplification means to prevent said differential amplification means from going into saturation;

d. compensation winding means for detecting said flux field produced by said stator winding and producing an A.C. signal which varies with said detected flux field;

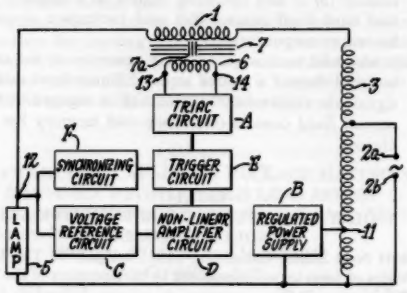
e. A.C. feedback resistive means connected to said compensation winding means for feeding back said A.C. signal produced in said compensation winding to said input of said differential amplification means to adjust overall gain of said circuitry; wherein said A.C. signal produced by said compensation winding is representative of an A.C. signal produced by a rotor winding and delivered to a load connected to said rotor winding such that said gain of said overall circuitry is properly adjusted for said load.

4,037,148

BALLAST CONTROL DEVICE

Michael Owens, and Wayne Ray Neal, both of Hendersonville, N.C., assignors to General Electric Company, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,027
Int. Cl.[2] G05F *1/66*
U.S. Cl. 323—17 **4 Claims**



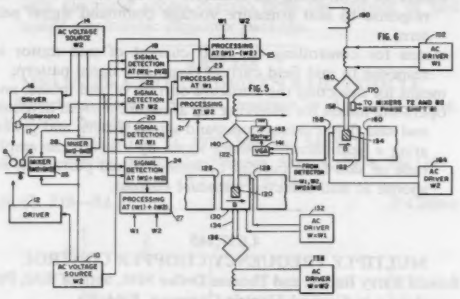
1. Ballast control circuit comprising, in combination, a source of alternating current, direct current supply means connected to said alternating current source, variable impedance means connected in series with said alternating current source, a load connected in series with said alternating current source and said variable impedance means, switch means connected to said variable impedance means and operable at a predetermined phase interval for controlling current to said variable impedance means and thereby controlling power to said load, actuating means connected to said switch means for turning on said switch means, control means connected to said actuating means for controlling the phase interval of operation of said switch means and for maintaining constant power to said load with variations in load voltage, synchronizing means connected to said actuating means for re-starting said phase interval at zero load voltage, said actuating means, control means and synchronizing means connected to said direct current supply means, and voltage reference means connected to said control means and responsive to the voltage of said load for controlling the operation of said control means, said control means comprising a non-linear amplifier circuit having decreasing voltage output in response to increasing voltage of said load until a predetermined load voltage is reached, after which the voltage output of said non-linear amplifier circuit increases with increasing load voltage.

4,037,149

MULTIPLE MODE MAGNETOMETERS

Simon Foner, 31 Payson Terrace, Belmont, Mass. 02178

Filed Dec. 18, 1975, Ser. No. 641,741
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 R **59 Claims**



21. A magnetometer for measuring the magnetic moment of a sample comprising:

means for applying a driving force to said sample;

sensor means for providing an output indication of the magnetic moment of said sample;

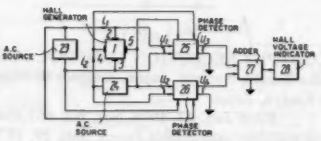
means for applying a driving signal to said sensor means whereby said output indication comprises a signal responsive to said driving signal modulated by a function of the force on said sample.

4,037,150

METHOD OF AND APPARATUS FOR ELIMINATING THE EFFECT OF NON-EQUIPOTENTIALITY VOLTAGE ON THE HALL VOLTAGE

Sergei Glebovich Taranov, Brest Litovsky Prospekt, 2, kv. 107; Voldmir Vasilievich Braiko, ulitsa Vernadskogo, 75, kv. 18a; Anatoly Danilovich Nizhensky, ulitsa Kapitanovskaya, 14, kv. 25/3; Vladimir Petrovich Belousov, ulitsa Vernadskogo, 61, kv. 3/1, all of Kiev; Dmitry Vasilievich Kovalchuk, ulitsa Chekistov, 4a, kv. 6, Zhitomir; Isaak Pavlovich Grinberg, ulitsa Gorkogo, 42, kv. 12, Zhitomir; Eugeny Eustafievich Laschuk, ulitsa Chekistov, 4a, kv. 7, Zhitomir; July Modestovich Panchishin, Brest-Litovsky Prospekt, 39, and Jury Trofimovich Chigirin, Brest-Litovsky Prospekt, 102, both of Kiev, all of U.S.S.R.

Continuation of Ser. No. 365,155, May 30, 1973, abandoned.
This application Apr. 25, 1975, Ser. No. 571,599
Int. Cl.[2] G01R *33/06*
U.S. Cl. 324—45 **2 Claims**



1. A method of eliminating the effect of a non-equipotentiality voltage on the voltage of a Hall generator, wherein a Hall generator, serving to measure and convert magnetic induction and comprising two pairs of opposite electrodes: the first and second pair, is fed with current through the first of said pairs of electrodes whereas the output signal is obtained from across the second of said pair of electrodes and, simultaneously, said

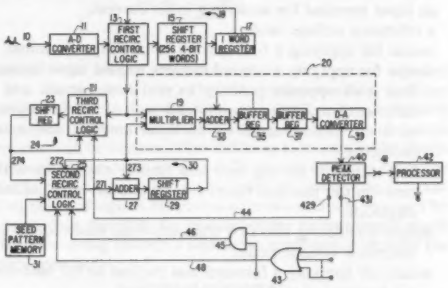
generator is fed with current equal in magnitude to but differing in frequency from the above-mentioned current through the second of said pairs of electrodes, whereas the output signal obtained from the first of said pairs of electrodes; the output signal at the second pair of electrodes being detected at the frequency of the signal applied to the first pair of electrodes, whereas the output signal at the first pair of electrodes is detected at the frequency of the signal applied to the second pair of electrodes; the true magnitude of the Hall voltage is assessed from the arithmetic mean of the magnitudes of the two detected signals.

4,037,151

APPARATUS FOR MEASURING THE PERIOD AND FREQUENCY OF A SIGNAL

Yasuhito Takeuchi, Kunitachi, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 27, 1976, Ser. No. 662,058
Int. Cl.² G01R *23/02*
U.S. Cl. 324—78 R **12 Claims**



1. An apparatus for measuring the period and frequency of a substantially periodic input signal waveform having random components by cross-correlating the input signal waveform with a reference waveform that is modified by the input signal waveform, said apparatus comprising:

first memory means disposed to receive the input signal waveform to be measured and to store selected sections of said input signal waveform.

second memory means coupled to said first memory means for storing a section of the reference waveform;

cross-correlator means coupled to said first and second memory means for repeatedly cross-correlating sections of the stored input signal waveform with said section of the stored reference waveform to produce a cross-correlation waveform;

peak-detector means coupled to said cross-correlator means for measuring the occurrence in time of relevant peaks of the cross-correlation waveform and producing an output signal indicative of such occurrences;

processing means coupled to receive the output signal of said peak detector means for deriving the period and frequency of said input signal waveform from said output signal; and

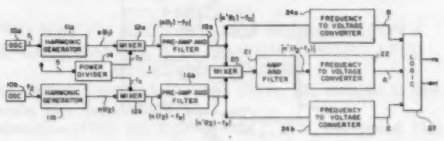
updating means coupled to said first and second memory means and to said peak detector means for periodically modifying the contents of the second memory means in accordance with sections of the input signal waveform stored in the first memory means.

4,037,152

FREQUENCY INDICATING SYSTEM

Russell W. Griffith, Dallas, Tex., assignor to United Technology Laboratories, Inc., Garland, Tex.

Filed Nov. 2, 1970, Ser. No. 85,837
Int. Cl.² G01R *23/14*
U.S. Cl. 324—79 R **10 Claims**



1. Frequency indicating system of the type including a plurality of processing channels for measuring the frequency of a received input signal of unknown frequency, each channel comprising:

a. first harmonic generating means for producing a first set of output signals, the frequencies of said output signals having harmonic relationships,

b. second harmonic generating means for producing a second set of output signals, the frequencies of said output signals having harmonic relationships, the fundamental frequency of the second set being offset from the fundamental frequency of the first set by a predetermined amount,

c. first and second mixer means respectively coupled to the outputs of said first and second harmonic generating means for combining said received input signal with said first and second set of output signals, thereby to produce a first and second series of output signals respectively from said first and second mixer means, each of said series of output signals having frequencies representing the difference between the frequency of said received input signal and the harmonic frequencies of said first and second set of outputs signals,

d. first and second filter means respectively coupled to the outputs of said first and second mixer means for passing only output signals from each of said mixer means representing the difference between the frequency of said received input signal and a specific one of the said harmonic frequencies,

e. third mixer means coupled to the outputs of said first and second filter means for combining the output signals passed by said first and second filter means, thereby to produce an output signal from said third mixer means having a frequency proportional to said specific harmonic, and

f. signal processing means for indicating the relative magnitude of the frequencies between the output signal from said first filter means and the output signals from said second filter means and producing an output signal dependent upon said relative magnitude indication.

4,037,153

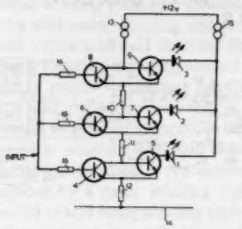
DIGITAL METERS

Gideon Kalanit, New Malden, England, assignor to Communications Patents Limited, London, England

Filed Dec. 2, 1975, Ser. No. 637,054
Claims priority, application United Kingdom, Dec. 3, 1974, 52174/74
Int. Cl.² G01R *19/00, 19/16*
U.S. Cl. 324—122 **11 Claims**

1. A meter for presenting a digital display representative of an analogue input signal, the meter comprising a first constant current source, a plurality of series connected control circuits each comprising a switch arranged to draw current from said first source, a second constant current source connected to a respective switch in each control circuit so that only when the

switch is closed a current may flow from the second source to a respective control circuit, individual display means for indicating each control circuit when a predetermined current flows from the second source, and an input signal circuit pro-



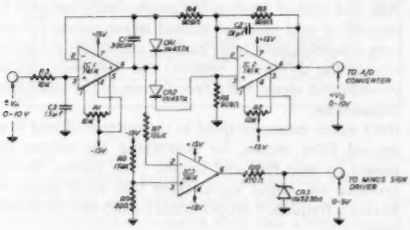
viding said analogue signal to each control circuit to close not more than two adjacent ones of the control circuit switches in said series to enable current to flow thereinto from the second source thereby to operate not more than two adjacent ones of said individual display means.

4,037,154

CIRCUIT FOR CALIBRATING INSTRUMENTS

Morteza M. Chamran, Elmhurst, and Allen R. Nemec, Naperville, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 15, 1976, Ser. No. 723,372
Int. Cl.[2] G01R *1/30, 1/02*
U.S. Cl. 324—123 R **10 Claims**



1. A circuit permitting an operator to accurately calibrate an instrument to produce a zero reading when the input is zero comprising, in combination:

a first amplifier for receiving a signal whose amplitude is to be indicated;

a feedback circuit coupled to said first amplifier so that said first amplifier operates in stable mode when the input to said first amplifier is above a first given magnitude and operates in oscillation mode when the input to said first amplifier is below said first given magnitude thereby producing oscillations at the amplifier output;

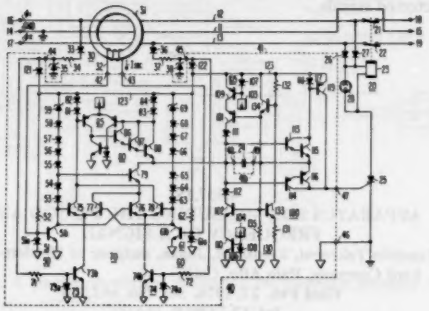
a comparator coupled to the output of said first amplifier for producing an output at one level when said first amplifier output is above a second given level and for producing an output at a second level when said first amplifier output is below said second given level, said comparator output being at either said level when said first amplifier operates in stable mode and being an oscillating signal between said two levels when said first amplifier operates in oscillation mode.

4,037,155

CURRENT-RESPONSIVE THRESHOLD DETECTION CIRCUITRY

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 461,268, April 15, 1974, Pat. No. 3,953,767.
This application Mar. 21, 1975, Ser. No. 560,721
Int. Cl.[2] G01R *19/16, 31/02;* **G03K** *5/20*
U.S. Cl. 324—133 **9 Claims**



1. A current-responsive threshold detector comprising:

an input terminal for accepting input current;

a reference voltage node;

means for applying a first current to said input terminal;

means for applying a second current to said input terminal that is of opposite polarity to said first current and of sufficient amplitude to counteract such of said first current as is not counteracted by an input current, said means including

a first transistor having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode,

means connecting said first transistor base electrode to said reference voltage node,

means for applying a forward bias current to the base-emitter junction of said first transistor, and

a first semiconductor rectifier element connected between said first transistor collector electrode and said input terminal and poled for conducting the normal collector current of said first transistor, which collector current corresponds to said second current;

impedance means connecting said input terminal to said reference voltage node for developing a potential thereacross responsive to input current exceeding the value required to completely counteract said first current; and

a voltage-responsive threshold detector connected to be responsive to the potential across said impedance means responsive to input current exceeding the value to completely counteract said current.

4,037,156

POWER SUPPLY TESTING APPARATUS

Roger Hubert Goujon; Jacques Pierre Raymond Raphael Menard, and Georges Claude Andre Pagny, all of Angers, France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 15, 1976, Ser. No. 677,254
Claims priority, application France, Apr. 30, 1975, 75.13698
Int. Cl.[2] G01R *31/00*
U.S. Cl. 324—158 R **18 Claims**

1. An equipment for testing DC power supplies, comprising:

i. a controller for setting the characteristic parameters of AC current supplied by a main supply to the power supply to be tested, said controller being connected between the electrical supply and inputs of the power supply to be tested,

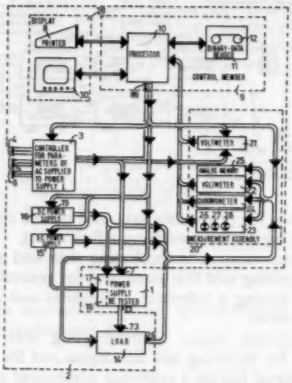
ii. at least one programmable load connected to output terminals of the power supply to be tested,

iii. fixed auxiliary power supplies for feeding DC current to the controller for controlling and starting the power supply to be tested,

iv. programmable auxiliary power supplies for supplying a primary DC current to the power supply to be tested,

v. an assembly for measuring the values of input and output currents supplied to and derived from the power supply,

vi. a control member, said control member including means for supplying control signals to: (a) the controller so that the



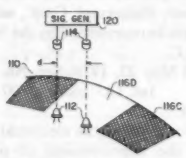
controller can set the parameters of the AC current supplied by the electrical supply, (b) the programmable auxiliary supplies so that the programmable supplies can derive variable DC output voltages, (c) the measuring assembly so that measurements can be derived from differing terminals in the equipment, and (d) the load, so that different impedance values can be set in the load, and vii) an assembly responsive to the control signals and signals indicative of measurements received by the measuring assembly for displaying the measurements made by the measuring assembly and the controls generated by the control member.

4,037,157

ELECTRO-OPTICAL SPEED TRANSDUCER

Eugene Campbell, Arvada, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 673,558
Int. Cl.[2] G01P *3/36*
U.S. Cl. 324—175 **11 Claims**



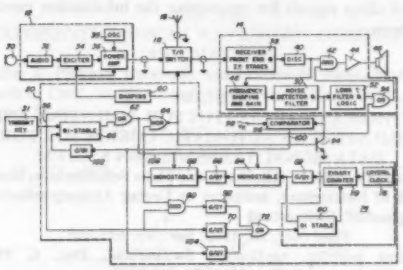
1. A speed transducer for measuring the speed of a moving surface, said transducer comprising motion detecting means comprising at least one light source, a pair of first and second photodetectors spaced from said light source and from one another for detecting light radiated by said light source along first and second light paths, respectively, each of said photodetectors producing an output when said light impinges thereon, and light chopping means, coupled to the moving surface, for alternately completing and breaking said light paths such that said second light path is completed before said first light path is broken; and said transducer further comprising means for combining said photodetector outputs such that a pulse is produced having a duration which is determined by the time interval between completion of said first light path and completion of said second light path and which is thus related to the speed of the moving surface.

4,037,158

TWO-WAY FM RADIO SYSTEM OPERATING ON A SINGLE CHANNEL AND PROVIDING SIMULATED DUPLEX OPERATION

Bruce Charles Eastmond, Downers Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 512,749, Oct. 7, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,359
Int. Cl.[2] H04B *1/44, 1/54*
U.S. Cl. 325—22 **12 Claims**



1. A control system for two-way apparatus having a transmitter and receiver both operable at a predetermined frequency, and an antenna suitable for transmitting to or receiving, at said frequency, remote transmitter and receiver apparatus which includes a similar control system, such control system including in combination:

means for actuating the system to the transmit mode including means for activating the transmitter and means coupling the transmitter to the antenna,

means operable in the transmit mode to periodically deactivate the transmitter and couple the receiver to the antenna for brief sampling intervals,

means for detecting the presence of a transmitted signal by said remote transmitter at the predetermined frequency during the sampling intervals,

latching means inhibiting transmission in response to a detected signal and locking the system to the receive mode,

means operable to override the latching means for continued operation in the transmit mode,

blanking means for muting the audio output of the receiver, and

means for detecting the sampling period of said remotely located transmitter and, in response thereto, causing the blanking means to mute the audio output of the receiver during each sampling period.

4,037,159

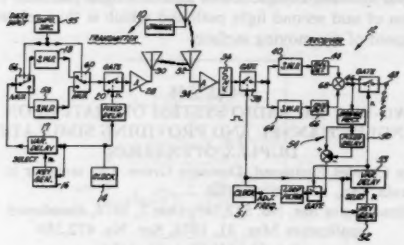
CHIRP COMMUNICATION SYSTEM

Albert R. Martin, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 1, 1974, Ser. No. 520,060
Int. Cl.[2] H04B *15/00;* **H03H** *7/10, 7/30*
U.S. Cl. 325—30 **13 Claims**

1. Apparatus for communicating between stations comprising means including a surface wave device for producing an information bearing chirp signal starting at any one of a plurality of initial frequencies in a range, and means for transmitting said chirp signal, means for receiving said chirp signal including a unitary matched surface wave device serving as an uni-

tary distributed filter means having time invariant parameters for compressing chirp signals starting at any of said initial



frequencies in said range, and means responsive to said compressed chirp signals for recovering the information content therefrom.

4,037,160

METHOD AND APPARATUS FOR ADJUSTING AND READJUSTING AN AUTOMATIC CORRECTOR FOR A DATA SIGNAL TRANSMISSION SYSTEM

Predrag Miloradovic, Kilchberg, and Hans Schaffhauser, Stadel, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Nov. 25, 1975, Ser. No. 635,110

Claims priority, application Switzerland, Dec. 6, 1974, 16268/74; Germany, Dec. 16, 1974, 2459455

Int. Cl.[2] H03H *7/36*

U.S. Cl. 325—42 **15 Claims**

1. A method for establishing optimum attenuator settings in a transversal equalizer intended for correction of distortion imposed upon pulse-amplitude-modulated communication signals in passage through a transmission medium comprising in a first phase:

a. generating a first reference signal sequence at the transmitting end of said transmission medium, transmitting it to the receiving end of the latter and feeding it to the transversal equalizer,

b. generating at the receiving end a second reference signal sequence identical with the first reference signal sequence,

c. deriving a first error signal from a comparison of a first signal of said second reference signal sequence and a corresponding signal of a first output signal sequence produced by said transversal equalizer when fed with said first reference signal sequence,

d. adjusting the attenuator settings in response to said error signal and thereby imparting to the error signal at least two different weights for the adjustment of at least two respective numbers of attenuator settings, and

e. repeating the steps c) and d) with subsequent signals of the respective signal sequences thus incrementally readjusting the attenuator settings in order that said output signal sequence and said second reference signal sequence at least approximatively converge; and in a second phase:

f. transmitting communication signals through the transmission medium and feeding them to the transversal equalizer,

g. deriving by threshold detecting third reference signals from a second output signals produced by said transversal equalizer when fed with the communication signals,

h. deriving second error signals from a comparison of subsequent second output signals and the corresponding third reference signals, and

i. readjusting the attenuator settings in response to said second error signals in order to compensate for alterations of the transmission system.

4,037,161

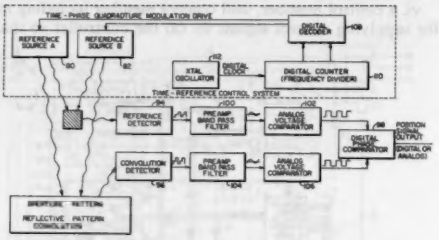
RATIO DETECTOR

William E. Westell, Weston, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Division of Ser. No. 490,698, July 22, 1974, Pat. No. 3,951,548. This application Dec. 3, 1975, Ser. No. 637,326

Int. Cl.[2] H03D *13/00;* **G06J** *1/00*

U.S. Cl. 328—133 **1 Claim**



1. A device for processing data, said device comprising:

a. source means for generating a first signal;

b. reference means communicating with said source means for receiving said first signal and for generating a second signal having a reference component and a quadrature component;

c. convolution means communicating with said source means for receiving said first signal and for generating a third signal having a reference component and a quadrature component, said third signal constituting a convolution of said first signal;

d. first processing means operatively connected to said reference means for receiving said second signal, said first processing means generating a fourth signal constituting a resultant of said second signal reference and quadrature components generated by said reference means;

e. second processing means operatively connected to said convolution means for receiving said third signal, said second processing means generating a fifth signal representing a resultant of said third signal reference and quadrature components generated by said convolution means; and

f. comparator means operatively connected to said first and second processing means, said fourth signal and fifth signal applied to said comparator means, said comparator means comparing said fourth signal and said fifth signal and generating a sixth signal representing the difference in phase of said fourth signal and said fifth signal.

4,037,162

PSEUDO SAMPLING

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1975, Ser. No. 581,258

Int. Cl.[2] H03K *5/00*

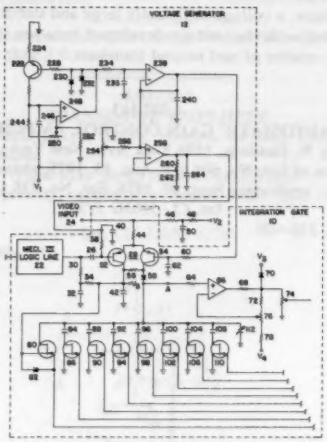
U.S. Cl. 328—151 **8 Claims**

1. In a system for sampling an electrical signal as a means for interrogating it, the improvement of pseudo-sampling said signal by sampling the value of it at discrete portions of finite width instead of instantaneously sampling said signal at discrete portions of infinitely narrow width, and by compensating the sampled value with an attenuation figure to obtain the true signal value comprising;

means for sampling the value of said signal wherein the sample period is of finite duration, and providing a separate result for each portion sampled;

means for modifying each said result by compensating for relative attenuation induced by the utilization of said sample means, wherein said relative attenuation is given by $\alpha(f) = 2 \sin (f \pi/2)/\pi f$, and wherein f is twice the

frequency of the signal sampled times the duration of the sample period;



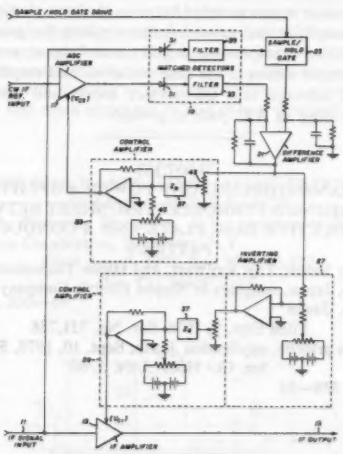
such that the modified results can be investigated as a means for interrogating said signal.

4,037,163

AUTOMATIC GAIN CONTROL CIRCUIT

John F. Nicholas, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,566
Int. Cl.[2] H04B *1/16;* H03B *3/02;* H03K *3/00*
U.S. Cl. 328—175 **3 Claims**



1. For use in a pulse radar system, an automatic gain control circuit comprising:

a. first and second controlled-gain amplifiers having similar control voltage versus gain characteristics;

b. first and second IF signal sources, said first source applying a reference signal as the input to said first controlled-gain amplifier and said second source applying the radar received signal as the input to said second controlled-gain amplifier;

c. first and second matched detectors, said first detector having as the input thereto the output of said first controlled-gain amplifier, and said second detector having as the input thereto said radar received signal;

d. sample-and-hold circuit means for sampling the output of said second detector at a rate related to the radar pulse rate and holding the sampled output between samplings;

e. a difference amplifier providing as its output a voltage varying in direct relation with the difference in outputs of said first detector and of said sample-and-hold circuit;

f. an inverting amplifier having as its input the output of said difference amplifier; and

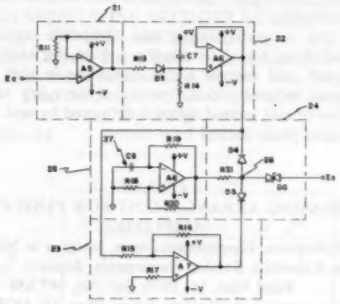
g. first and second control amplifiers, said first control amplifier being connected to receive the output of said difference amplifier and to control said first controlled-gain amplifier in accordance therewith, said second controlled amplifier being connected to receive the output of said inverting amplifier and to control said second gain-controlled amplifier in accordance therewith.

4,037,164

EXPONENTIAL DECAY WAVE FORM GENERATOR AND METHOD

Shailer T. Pickton, Lafayette, and Gordon B. Dean, Martinez, both of Calif., assignors to Systron Donner Corporation, Concord, Mass.

Filed Feb. 18, 1976, Ser. No. 659,139
Int. Cl.[2] H03K *4/04*
U.S. Cl. 328—187 **22 Claims**



1. A wave form generator responsive to an input command signal, comprising an input amplifier having a high input impedance, and a low output impedance, for receiving the input command signal at the input thereof and providing an output therefrom, an exponential signal generator coupled to said output from said input amplifier and producing an exponential signal envelope at the output thereof, means coupled to said exponential signal generator output and providing a reverse polarity exponential signal envelope at the output thereof, an astable element coupled to receive said exponential and inverse exponential signal envelopes providing an exponentially decaying alternating output at a predetermined frequency at the output thereof.

4,037,165

SYNCHRONOUS SIGNAL GENERATING SYSTEM WITH PHASE-LOCKED LOOP CIRCUIT

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 31, 1976, Ser. No. 672,629
Claims priority, application Japan, Apr. 1, 1975, 50-38557
Int. Cl.[2] H03D *3/00*
U.S. Cl. 329—124 **6 Claims**

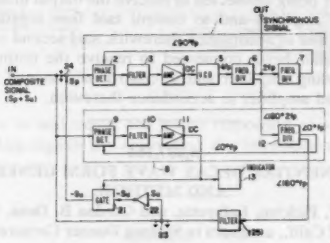
5. A system for use in an FM receiver and for generating a synchronous signal which is synchronous with a first signal contained in a composite signal consisting of said first signal and a second signal having a frequency different from that of

said first signal, characterized in that said first signal is a pilot signal and that said second signal includes a main-channel signal and a sub-channel signal,

said system comprising:

a phase-locked loop circuit which, upon receipt of at least said first signal through a first means, is locked with said first signal received and which thereby generates said synchronous signal,

second means for receiving at least said composite signal for thereby generating a cancelling signal, and



a gate connected in series between said first means and second means and being rendered conductive upon receipt of said composite signal to thereby deliver, as said cancelling signal, the output of said second means to said first means,

said first means receiving said composite signal and said cancelling signal to thereby cancel, by said cancelling signal, said second signal contained in said composite signal, whereby said first signal carrying substantially none of said second signal is delivered by said first means to said phase-locked loop circuit.

4,037,166

BIASING ARRANGEMENT FOR PUSH-PULL AMPLIFIER

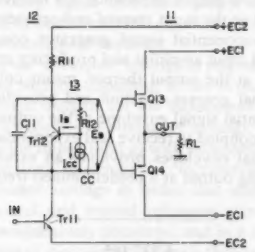
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 16, 1976, Ser. No. 667,438

Claims priority, application Japan, Mar. 19, 1975, 50-33152; Mar. 19, 1975, 50-36734[U]; Mar. 19, 1975, 50-36735[U]

Int. Cl.[2] H03F *3/18*

U.S. Cl. 330—13 **8 Claims**



1. A biasing arrangement for a push-pull amplifier, comprising:

a first transistor for driving a pair of field effect transistors forming said push-pull amplifier;

a second transistor connected in series in the collector circuit of said first transistor, the voltage between the collector and the emitter of said second transistor being applied to the gate electrodes of said field effect transistors as the gate bias voltage for these field effect transistors;

a first resistor connected between the collector and the base of said second transistor, and

a constant current source connected to the base of said second transistor for causing a substantially constant current to flow through said first resistor, the constant current having such a value that it develops, across said first resistor, a voltage sufficiently large and stabilized as compared with the voltage developed between the base and the emitter of said second transistor.

4,037,167

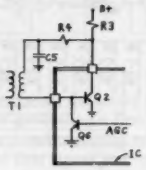
AUTOMATIC GAIN CONTROL AMPLIFIER

Kingsley N. Hastings, 1590 York Ave., New York, N.Y. 10028

Division of Ser. No. 604,175, Aug. 13, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 725,153

Int. Cl.[2] H03G *3/30*

U.S. Cl. 330—29 **3 Claims**



1. An automatic gain control amplifier comprising:

a. at least one transistor amplifier having a base, collector, and emitter, said collector being connected to a D.C. supply voltage through a collector resistor, said emitter being connected to ground;

b. a tuned circuit including transformer means for applying a signal of a predetermined frequency to said base;

c. a biasing resistor coupled between said collector and said tuned circuit, said biasing resistor being much larger than said collector resistor;

d. transistor means coupled between the base of said transistor amplifier and ground for controlling the gain of said amplifier in response to a gain control signal; and

e. capacitor means in the base circuit of said amplifier coupled between said transformer means and ground for providing an A.C. path to ground.

4,037,168

TRANSISTORIZED UHF POWER AMPLIFIER COMPRISING A FERROELECTRIC SHEET BETWEEN A CONDUCTIVE BASE PLATE AND A CONDUCTIVE PATTERN

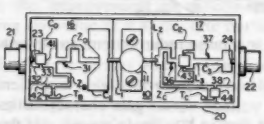
Hidehiko Katoh; Yuji Kajiwara, and Hideo Takamizawa, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Sept. 9, 1976, Ser. No. 721,756

Claims priority, application Japan, Sept. 10, 1975, 50-110200

Int. Cl.[2] H03F *3/04, 3/60*

U.S. Cl. 330—31 **7 Claims**



1. In a transistorized high-frequency power amplifier comprising an electroconductive base plate, a power transistor on said base plate, at least one pattern of an electroconductive material operatively connected to said transistor, and a sheet of a material below said pattern in direct contact with said base

plate, the improvement wherein said material is a ferroelectric material represented by the formula:

$$(1 - x)BaO.xTiO_2,$$

where x represents a constant that is not less than about 0.7 and that is less than 1.0.

4,037,169

TRANSISTOR AMPLIFIER

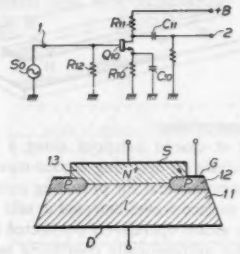
Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,043

Claims priority, application Japan, May 21, 1974, 49-57645[U]

Int. Cl.² H03F 3/16

U.S. Cl. 330—35 **5 Claims**



1. A transistor amplifier comprising an input terminal for receiving audio signals to be amplified, an output terminal for delivering the amplified audio signals, a field effect transistor for amplifying said audio signals and including gate, source and drain electrodes, an intrinsic semiconductor region in said field effect transistor to which one of said electrodes is connected so that a vertical channel is formed in said field effect transistor whereby its drain current does not become saturated when its drain voltage is increased so as to exhibit triode-type characteristics, means defining a reference potential, a resistor and capacitor connected in a parallel circuit between said source electrode and said reference potential, means connecting said gate electrode directly to said input terminal, and means connecting said drain electrode to said output terminal.

4,037,170

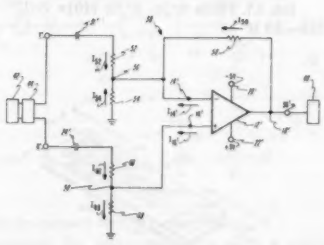
DIFFERENCE AMPLIFIER HAVING EXTENDED COMMON MODE RANGE

Glenn L. Richards, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,827

Int. Cl.² H03F 3/45

U.S. Cl. 330—69 **5 Claims**



1. A differential input-to-single ended output buffer circuit which operates to reject a common mode signal while passing a differential signal, comprising:

a. a pair of circuit input terminals for receiving a differential input signal upon which may be superimposed an undesired common mode signal, said terminals comprising first and second circuit input terminals,

b. an operational amplifier having a non-inverting input, an inverting input, and an output, said operational amplifier exhibiting a characteristic of rejecting a common mode signal applied between said non-inverting and said inverting input provided said common mode signal is within a predetermined signal range,

c. a first voltage divider connected to said first circuit input terminal, said first voltage divider comprising first and second serially connected impedances and being so construed and arranged to apply the signal present at the node between said impedances to the non-inverting input of the operational amplifier to eliminate said undesired common mode signal,

d. feedback means connected between the output of the operational amplifier and the inverting input of the operational amplifier, and

e. a second voltage divider connected to said second circuit input terminal, said second voltage divider comprising third and fouth serially connected impedances and being so constructed and arranged to directly apply the signal present at the node between said impedances to the inverting input terminal of the operational amplifier, whereby the predetermined range of common mode signals which are rejected by the operational amplifier is extended.

4,037,171

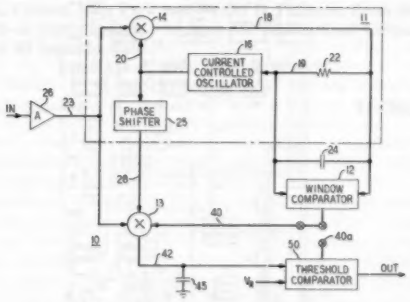
HIGH SPEED TONE DECODER UTILIZING A PHASE-LOCKED LOOP

Robert Roger Cordell, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 17, 1976, Ser. No. 658,728

Int. Cl.² H03B 3/04

U.S. Cl. 331—14 **14 Claims**



1. A tone decoder circuit comprising

a controllable oscillator connected in a phase-locked loop for generating signals having a frequency determined by a control signal produced within the loop, the phase-locked loop having a capture range,

a synchronous detector, responsive to an input signal of the tone decoder and to a first signal from the controlled oscillator, for producing a signal having a magnitude dependent upon the magnitudes of the input signal and the first signal from the controllable oscillator, and

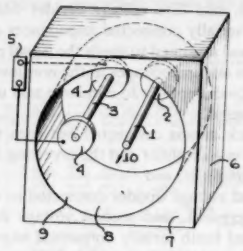
means, connected to the loop and responsive to the control signal within the loop, for monitoring when the generated signal is within a predetermined frequency range substantially narrower than the capture range of the phase-locked loop, the monitoring means applying a signal to the synchronous detector for inhibiting the output of the synchronous detector when the first signal from the controlled oscillator is outside of the predetermined frequency range.

4,037,172

PLASTIC LASER MATERIALS

Nicolae Filipescu, Arlington, Va.; Nelson McAvoy, Silver Spring; Morton R. Kagan, Potomac, both of Md., and Francis A. Serafin, Alexandria, Va., assignors to American Standard, Inc., New York, N.Y.

Filed Sept. 17, 1963, Ser. No. 309,560
Int. Cl.[2] H01S *3/16*
U.S. Cl. 331—94.5 E **21 Claims**



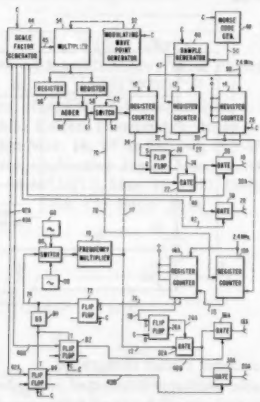
1. An optical maser material comprising a solid polymeric matrix having uniformly distributed therein a rare earth metal chelate.

4,037,173

MULTIPLE CARRIER MODULATION SYNTHESIS

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed July 27, 1976, Ser. No. 708,923
Int. Cl.[2] G01S *1/16, 1/18;* H03K *7/08*
U.S. Cl. 332—9 R **23 Claims**



1. A method for synthesizing the production of modulated radio carrier waves from at least two radio carriers including

continuously storing the same group of different digital sample point values signifying various modulation levels required for each of said radio carriers at successive points in time to suggest the presence of at least one modulation signal waveform for each of said carriers,

gating the first of said carriers on and off,

gating the second of said carriers on only during the off periods of the first carrier,

reading out said sample point values in timed sequence,

transferring and applying said digital sample point values to modify said carrier waves in timed sequence by modification of each carrier by one sample point value during each period when each carrier wave is gated on to thus produce modified carriers,

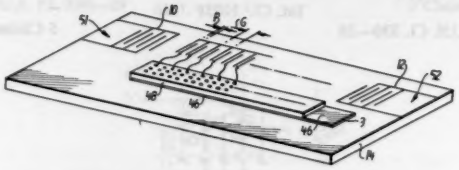
the modifications of each of said carriers being such as to be recognized by a receiver as modulation by a respective waveform modulation signal.

4,037,174

COMBINED ACOUSTIC SURFACE WAVE AND SEMICONDUCTOR DEVICE PARTICULARLY SUITED FOR SIGNAL CONVOLUTION

Robert A. Moore, Arnold, and Herbert Warren Cooper, Hyattsville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1973, Ser. No. 423,650
Int. Cl.[2] H03H *9/26, 9/32, 7/28;* H03K *5/20*
U.S. Cl. 333—30 R **5 Claims**



1. Apparatus comprising:

means carried at spaced locations along a surface of an acoustic substrate for detecting surface waves propagated along said substrate and for providing output signals related to the surface waves detected at said locations,

semiconductor means operatively connected to said detecting means for arithmetically combining said output signals,

said detecting means comprises a plurality of generally parallel, spaced, electrically conductive sampling fingers disposed on a surface of said substrate normal to a propagation path of said surface waves,

said semiconductor means comprises a plurality of semiconductor diodes each having one like electrode operatively connected to at least one of said sampling fingers, the other like electrode of each of said diodes being operatively connected to a common output terminal,

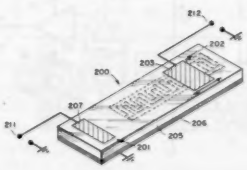
wherein said semiconductor diodes are Schottky barrier diodes formed through a sheet of substrate material, said common output terminal comprising a sheet of electrically conductive material having one surface disposed in contact with one surface of said sheet of substrate material and in electrical contact with said other like electrode of each of said diodes.

4,037,175

VARIABLE DELAY DEVICE

Robert Kansy, Fort Wayne, Ind., and Jon Culton, Champaign, Ill., assignors to University of Illinois Foundation

Filed Jan. 2, 1974, Ser. No. 430,149
Int. Cl. H03h *9/26, 9/30;* H01v *7/02*
U.S. Cl. 333—30 R **6 Claims**



1. A surface wave variable delay device comprising:

an unpoled ferroelectric substrate having a first transducer thereon;

a substantially sinusoidal poled region at said surface and spaced from said first transducer;

a metal plate slidably disposed over said poled region; and

a metal electrode disposed on the opposing surface of said substrate, said plate and said electrode comprising a second transducer whose effective position is movable with respect to said first transducer.

4,037,176

MULTI-LAYERED SUBSTRATE FOR A SURFACE-ACOUSTIC-WAVE DEVICE

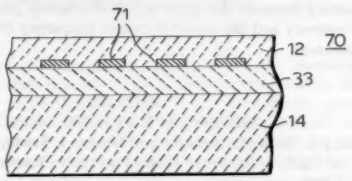
Shusuke Ono, Takatsuki; Kiyotaka Wasa, Nara, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 16, 1976, Ser. No. 667,374

Claims priority, application Japan, Mar. 18, 1975, 50-33417; Mar. 18, 1975, 50-33419; June 18, 1975, 50-74873

Int. Cl.[2] H03H *9/30, 9/02;* **H01L** *27/20;* **H03H** *9/26*

U.S. Cl. 333—30 R **17 Claims**



1. A multi-layered substrate for a surface-acoustic-wave device, comprising, in the following order, a base, an intermediate layer and a piezoelectric layer, the temperature coefficient of a surface-acoustic-wave phase velocity in said piezoelectric layer being different from that in said base, said piezoelectric layer having a layer thickness less than the wave length of said surface-acoustic-wave, the sign of the temperature coefficient of said intermediate layer being different from that of said piezoelectric layer or said base, said piezoelectric layer and said intermediate layer being made of zinc oxide and silicon oxide, respectively.

4,037,177

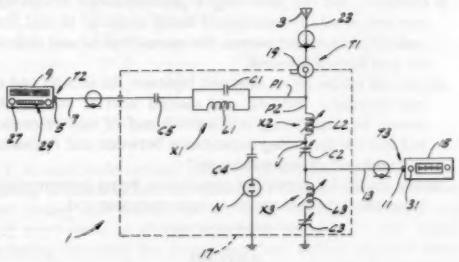
RADIO-FREQUENCY COUPLER

Elasco A. Tyrey, 239 Estridge, St. Louis, Mo. 63137

Filed Mar. 3, 1976, Ser. No. 663,632

Int. Cl.[2] H03H *7/10, 7/38, 7/46, 7/14*

U.S. Cl. 333—32 **9 Claims**



1. A radio-frequency coupler comprising:

a first terminal for interconnection with a conventional automobile receiving antenna used for receiving rf transmissions within a first band of radio frequencies, a second terminal for interconnection with a receiver operating within the first band of radio frequencies and a third terminal for interconnection with a transceiver operating within a second band of radio frequencies different from the first band;

first and second rf transmission paths, the first rf transmission path extending between the first terminal and the second terminal and the second rf transmission path extending between the first terminal and the third terminal;

a first resonant circuit connected in the first rf transmission path and tuned to offer a first impedance to rf transmissions within the first band of frequencies but a second and higher impedance to rf transmissions within the second band of frequencies thereby to pass rf transmissions in the first band but substantially block those in the second band;

a second resonant circuit connected in the second rf transmission path and tuned to resonate at a frequency within the second frequency band thereby to offer a first impedance to rf transmissions within the first band of frequencies but a second and lower impedance to rf transmissions within the second band of frequencies so that rf transmissions within the second band are passed but those within the first band are substantially blocked; and

a third resonant circuit connected between the third terminal and electrical ground and tuned to resonate at a frequency outside the second band of frequencies whereby the second and third resonant circuits form a series-connected path between the first terminal and electrical ground and the impedance of the third resonant circuit at the second band of frequencies allows maximum rf energy within the second band of frequencies to be transferred between the antenna and the transceiver thereby permitting the conventional automobile receiving antenna normally used only for receiving rf transmissions within the first frequency band to also be used for sending and receiving rf transmissions within the second frequency band.

4,037,178

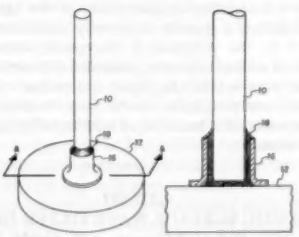
MEANS FOR ATTACHING A FERRITE TRANSDUCER TO A DISK RESONATOR

Lee G. Cornett, Villa Park, and Wesley D. Peterson, Santa Ana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 5, 1976, Ser. No. 673,552

Int. Cl.[2] H03H *9/02*

U.S. Cl. 333—71 **11 Claims**



1. Means for attaching a ferrite transducer rod to a disk resonator, comprising:

a bonding adhesive, and

an annular housing affixed to the disk for receiving the rod while said adhesive is deposited in said housing.

4,037,179

MECHANICAL FILTER DEVICE

Toshio Terayama, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 11, 1975, Ser. No. 595,143

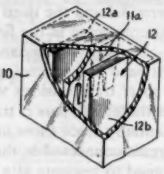
Claims priority, application Japan, July 15, 1974, 49-80948

Int. Cl.[2] H03H *9/02*

U.S. Cl. 333—71 **15 Claims**

6. A mechanical filter device comprising: a casing; a tuning

fork mounted to undergo vibration within said casing and having a set of vibratable leg portions; and dampening means connected to said casing and extending between adjoining ones



of said vibratable leg portions so as to effectively dampen abnormal vibration of said leg portions caused by external shock or impact.

4,037,180

ELECTRO-MECHANICAL FILTER

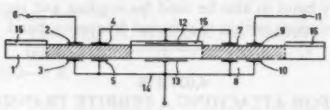
Willem Reindert De Wild, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,170

Claims priority, application Netherlands, Mar. 6, 1975, 7502640

Int. Cl.[2] H03H *9/02, 9/26, 9/32*

U.S. Cl. 333—72 **6 Claims**



1. An electromechanical filter, comprising a wafer of a piezoelectric material having input and output electrodes arranged thereon so that in operation an electrical input signal applied to the input electrodes produces in the piezoelectric material a corresponding mechanical vibration which is reconverted into an electrical output signal at the output electrodes, the transmission characteristic of the input to output signals exhibiting a specific frequency dependence which is determined by the mechanical resonance properties of the wafer, and an acoustic damping material disposed on the wafer outside the area where the input and output electrodes are situated and comprising an elastic base material throughout which a powder of a material of substantially higher specific gravity is mixed.

4,037,181

ACOUSTIC SURFACE WAVE FILTER DEVICES

Hideharu Ieki; Hideki Ishiyama, and Atushi Inoue, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

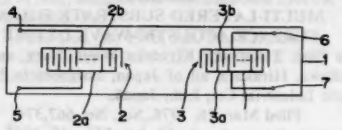
Filed Mar. 12, 1976, Ser. No. 666,303

Claims priority, application Japan, Mar. 12, 1975, 50-30300; June 11, 1975, 50-79944[U]; Dec. 9, 1975, 50-168768[U]; Dec. 12, 1975, 50-148638; Dec. 27, 1975, 50-158969

Int. Cl.[2] H03H *9/02, 9/26, 9/32;* **H01L** *41/04*

U.S. Cl. 333—72 **5 Claims**

1. An acoustic surface wave filter device for use in video IF stages in television receivers and the like, which comprises a substrate of a piezoelectric material and a spaced pair of input and output transducers formed on said substrate, one of said transducers comprising a pair of interleaved-comb-type electrodes with a plurality of constant length and uniformly spaced electrode elements and having a frequency response curve wherein attenuation poles at the both sides of the main lobe thereof, respectively, occur at frequencies corresponding to the upper adjacent-channel picture IF carrier frequency and to the lower adjacent-channel sound IF carrier frequency, the other of said transducers comprising a pair of interleaved-comb-type electrodes and having a frequency response curve wherein the attenuation poles at the both sides of the main



lobe, respectively, occur at a frequency higher than the lower adjacent-channel sound IF carrier frequency and at a frequency between the upper adjacent-channel picture IF carrier frequency and the sound If carrier frequency of the associated channel.

4,037,182

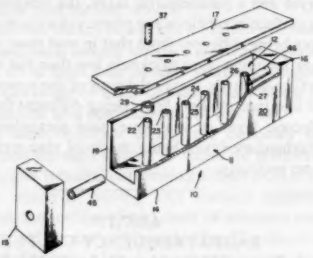
MICROWAVE TUNING DEVICE

Gary L. Burnett, Anaheim, and George I. Tsuda, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 3, 1976, Ser. No. 720,340

Int. Cl.[2] H01P *1/20, 7/00*

U.S. Cl. 333—73 R **3 Claims**



1. A tunable microwave device, comprising:

housing means having first and second walls;

a resonator rod for providing a predetermined resonance, one end of said resonator rod being mounted to said first wall of said housing means, the second end of said resonator rod having a recess;

alignment means being disposed between the second end of said resonator rod and said second wall of said cavity means for supporting said second end of said resonator rod and for providing capacitance between said resonator rod and said cavity means; and

tuning means for providing capacitance being incrementally insertable into said recess in said resonator rod.

4,037,183

REPLACEABLE SOLID STATE TRIP UNIT

George Gaskill, Hatboro, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

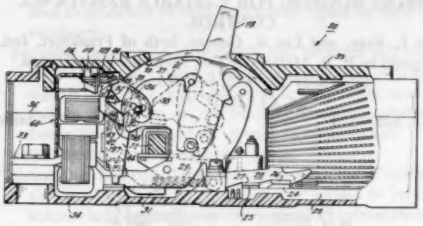
Filed Mar. 29, 1976, Ser. No. 671,077

Int. Cl.[2] H01H *73/00;* **H02H** *3/08*

U.S. Cl. 335—6 **10 Claims**

1. A removable and replaceable automatic multipole trip unit assembly for a multipole circuit breaker, said assembly

including an insulating base comprising a front wall; for each pole of said trip unit a main conductor extending through said wall at the bottom thereof and projecting forward and rearward thereof; an input transformer comprising a first multi-turn secondary and a single turn primary provided by said conductor, an output transformer comprising a multi-turn primary fed by said secondary and a second multi-turn secondary having more turns than said multi-turn primary; mechanical latch means secured to said base in position for cooperation with a trip free circuit breaker contact operating mechanism



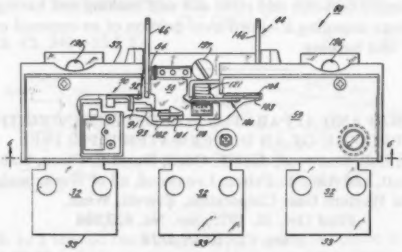
disposed forward of said wall; controllable means for releasing said latch; solid-state control means having an input fed by all of said second secondaries and an output operatively connected to said controllable means for activation thereof to release said latch when predetermined current conditions are present in any of said main conductors; all of said input transformers positioned in a first row disposed behind said wall; all of said controllable means positioned in a second row disposed behind said wall row above said first row; said control means positioned behind said wall; said second row being between said control means and said first row.

4,037,184

LOCKOUT AND COVER INTERLOCK FOR CIRCUIT BREAKER

Francis W. Kempisty, Jr., and John L. Lundgren, both of Philadelphia, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 9, 1976, Ser. No. 675,261
Int. Cl.[2] H01H *83/00, 33/48*
U.S. Cl. 335—6 **7 Claims**



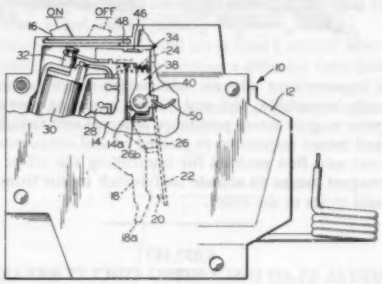
1. A multi-pole molded case circuit breaker including cooperating contact means; an operating mechanism for opening and closing said contact means; latch means for maintaining said mechanism in a reset condition; solid state trip means including circuitry for processing fault signals derived from currents flowing through said circuit breaker; said trip means including a removable and replaceable first means including an element of said circuitry which controls rating characteristics thereof; a housing wherein said contact means, said mechanism, said latch means and said trip means are disposed; interlock means biased to a first position in operative engagement with said latch means to release the latch and thereby trip said mechanism; said housing including cover means which when in a closed position operating said interlock means to a second position wherein said latch means is permitted to be returned to a latching position; lockout means biased to a first position in operative engagement to block movement of said latch means to its said latching position; said first means when operatively connected in said circuitry operating said lockout means to a second position wherein said latch means is permitted to be returned to said latching position.

4,037,185

GROUND FAULT CIRCUIT BREAKER WITH TRIP INDICATION

Keith W. Klein, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,904
Int. Cl.[2] H01H *83/02*
U.S. Cl. 335—18 **9 Claims**



1. A circuit interrupting device comprising, in combination:

A a molded case;

B. a trip unit disposed within said case and operative in response to an overcurrent condition to initiate interruption of a circuit protected by the device;

C. an electronic module positioned within said case and sensitive to ground leakage current occasioned by a ground fault on the circuit;

D. a trip solenoid position within said case and electrically connected for energization under the control of said module in the event of a ground fault;

E. linkage interconnecting said solenoid and said trip unit, said linkage articulated by said solenoid upon energization thereof to induce operation of said trip unit to initiate circuit interruption;

F. mechanical trip indicator means movable between first and second indicating positions under the control of said trip solenoid, whereby to indicate by virtue of its position following a circuit interruption whether an overcurrent condition or a ground fault condition was responsible; and

G. detent means acting on said trip indicator means to releasably sustain said trip indicator means in the one of its first and second indicating positions assumed under the control of said trip solenoid following a circuit interruption.

4,037,186

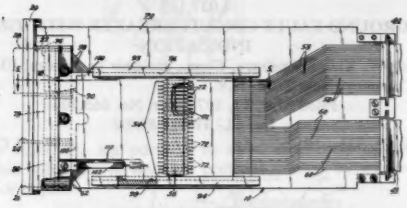
CONNECTING AND SWITCHING SYSTEM, AND SWITCHING APPARATUS SUITABLE FOR USE THEREIN

James E. Palmer, Moorestown; Donald C. Lavallee, Haddon Heights, and George Huber, Mount Laurel, all of N.J., assignors to Spectron Corporation, Mount Laurel, N.J.

Filed Feb. 9, 1976, Ser. No. 656,597
Int. Cl.[2] H01R *33/30;* **H01H** *5/02*
U.S. Cl. 335—206 **15 Claims**

1. In connecting apparatus of the class comprising: a first plurality of separate conductors; a second plurality of separate conductors; switch means connected between said first plurality of conductors and said second plurality of conductors; a third plurality of separate conductors; quick-disconnect connector means for temporarily connecting said third plurality of

conductors to said first plurality of conductors when said connector means is in a first position; and switch actuating means for actuating said switch means between its closed and open states to disconnect said first plurality of conductors from said second plurality of conductors when said connector means is in said first position and to connect said first plurality of conductors to said second plurality of conductors at other times;



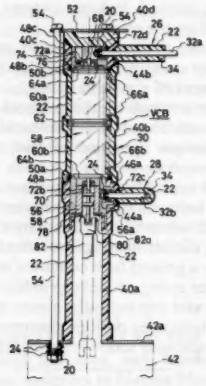
the improvement wherein said switch means are magnetically actuatable, and said switch actuating means comprise magnet means positioned adjacent said switch means and means responsive to placing of said connector means into said first position for controlling the effect of said magnet means to actuate said switch means from one of said states to the other.

4,037,187

METAL CLAD INSULATING CIRCUIT BREAKER

Hitoshi Himi, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Dec. 4, 1974, Ser. No. 529,484
Claims priority, application Japan, Dec. 10, 1973, 48-139173
Int. Cl.[2] H01H *61/00*
U.S. Cl. 337—121 **12 Claims**



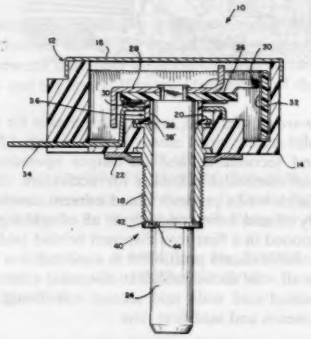
1. A circuit breaker arrangement comprising a casing of solid insulating material with a plurality of solid insulating material units, a breaker unit within said casing and having a movable and a fixed contact therein, two insulated electric conductors joined to said casing, and fastening means for fastening said plural solid insulating material units into a body, each of said conductors being electrically connected respectively to said fixed and movable contacts of said breaker unit, said conductors including an elongated electric conductor and a solid insulating material layer formed therearound; a first solid insulating unit with a solid insulated supporting member including a first connecting member and a taper on a one open end portion, the circumferential surface thereof having a tapered cavity, an interrupting member and voltage dividing capacitors, a second solid insulating unit enveloping said interrupting member and voltage dividing capacitors and being joined to said first solid insulating unit, a third solid insulating unit including a second connecting member and joined to said second solid insulating unit, a fourth solid insulating unit for fixing said second connecting member to said third solid insulating unit therein, first and second connecting jacket members for connecting between said first and second connecting members respectively, and fastening means for fastening said four solid insulating units into a body.

4,037,188

THRUST BUSHING FOR VARIABLE RESISTANCE CONTROL

Robert L. Frey, and Lee R. George, both of Frankfort, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed July 23, 1975, Ser. No. 598,171
Int. Cl.[2] H01C *10/34*
U.S. Cl. 338—174 **2 Claims**



1. In a variable resistance control wherein electrical contact means is carried by a rotor and rotates therewith while electrically bridging a resistance element and a collector within a housing, said rotor carried by a shaft rotating within and extending through a bushing, said bushing fixedly carried by said housing, the improvement comprising:

a. stop means carried by said shaft and engaging an end of said bushing, and

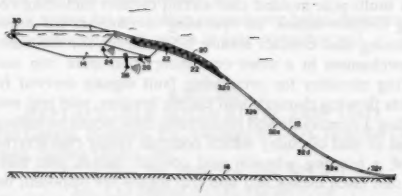
b. a molded one piece hat washer surrounding said shaft and trapped between said rotor and said bushing and having a flange engaging a lapped over portion of an opposed end of said bushing.

4,037,189

METHOD AND APPARATUS FOR DETERMINING THE PROFILE OF AN UNDERWATER PIPELINE

Duncan Bell, Stanwood; Jack L. Odell; David E. Olson, both of Everett, and Allen E. Peirce, Lynnwood, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Oct. 20, 1975, Ser. No. 623,584
Int. Cl.[2] G01S *5/18*
U.S. Cl. 340—6 R **27 Claims**



1. A method for providing an indication of the position of an underwater pipeline extending from a pipe laying vessel to an

ocean with respect to a reference plane equidistant from first and second spaced apart reference points, said method comprising:

providing first and second acoustic transmitter means at said first and second reference points, respectively, for selectively transmitting respective acoustic signals, said reference points being fixedly located with respect to said vessel beneath the water surface;

securing a plurality of acoustic receiver means to said pipeline at spaced-apart points along the length thereof for generating respective acknowledgement signals responsive to detection of such an acoustic signal by each of said receivers;

providing a common information link between said receiver means and said vessel for conveying said acknowledgment signals from said receiver means to said vessel, said information link being an electrical conductor extending between said vessel and all of said receiver means;

actuating said first transmitter means;

measuring the elapsed times from transmission of said acoustic signal from said first transmitter means to receipt of acknowledgment signals through said information link from each of said receiver means;

calculating the distance from said first transmitter means to each of said receiver means corresponding to each of said elapsed time measurements;

actuating said second transmitter means;

measuring the elapsed times from transmission of said acoustic signal from said second transmitter means to receipt of acknowledgment signals through said information link from each of said receiver means;

calculating the distance from said second transmitter means to each of said receiver means corresponding to each of said elapsed time measurements; and

processing said distance calculations to provide a visual indication of the position of said pipeline with respect to said reference plane.

4,037,190

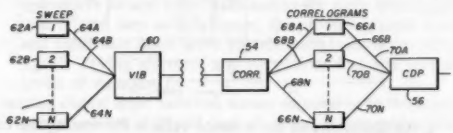
METHOD OF VIBRATORY SEISMIC PROSPECTING FOR MINIMUM CORRELATION NOISE

Lincoln A. Martin, Altadena, Calif., assignor to Geophysical Systems Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 617,858, Sept. 29, 1975. This application Sept. 29, 1975, Ser. No. 617,858

Int. Cl.[2] G01V *1/36*

U.S. Cl. 340—15.5 TA **16 Claims**



1. In a seismic recording and processing system in which at least one vibratory source is used to generate a seismic wave in the earth, and where a plurality of repetitions of the source are made, the improved method of operation directed to minimizing the correlation noise on the record, comprising the steps of;

a. operating said at least one vibratory source with a first variable frequency reference sweep signal comprising a vibratory signal of selected starting and ending frequencies (terminal frequencies);

b. detecting the first received signal resulting from said first sweep;

c. correlating said first received signal with said first sweep to form a first correlogram;

d. repeating steps (a), (b), (c) at least a second time with a second reference sweep signal having at least one terminal frequency which is different from that of said first reference sweep signal, to provide at least a second correlogram; and

e. stacking said first and said at least second correlograms to provide a first stacked record.

13. In a seismic recording and processing system in which at least one vibratory source is used to generate a seismic wave in the earth, and where a plurality of repetitions of the source are made, the improved method of operation directed to minimizing the correlation noise on the record, comprising the steps of;

a. operating said at least one vibratory source with a first selected variable frequency reference sweep signal comprising a vibratory signal of selected band width and terminal frequencies, and having a first selected time duration;

b. detecting the first received signal resulting from said first sweep;

c. correlating said first received signal with said first sweep to form a first correlogram;

d. repeating steps (a), (b) and (c) at least a second time with a reference sweep signal having a different time duration than said first sweep; and

e. stacking said first and said at least second correlograms to provide a first stacked record.

4,037,191

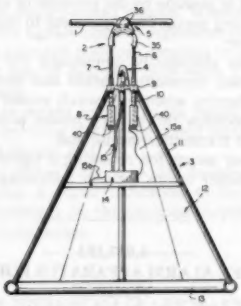
AIRCRAFT WARNING MARKER ASSEMBLY FOR POWER LINES

Richard Deane, Rossland, and Aage C. Sylvest, Castlegar, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Oct. 4, 1976, Ser. No. 729,607

Int. Cl.[2] G08G *5/00;* **B64F** *1/18*

U.S. Cl. 340—28 **8 Claims**

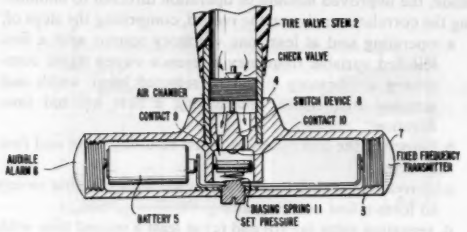


1. A warning marker assembly for attachment to a power transmission line comprising a clamp that rigidly fastens to the power line and supports an inverted U-shaped flexible steel cable having two ends which hang down in parallel and each pass through an insulating tube and vibrations absorbing means, each of said ends having an abutment to support the insulating tube and vibration absorbing means, said assembly also including a truncated cone-shaped structure having an electrically conductive framework including a top plate supported by said vibration absorbing means, a bottom ring, and a plurality of ribs interconnecting the top plate and bottom ring, said framework supporting a plurality of plastic panels each extending between adjacent ribs and fitting into slots in said ribs, said assembly including an electrically conductive connection between the cable and the electrically conductive framework.

4,037,192
FLAT TIRE INDICATING DEVICE

Burt L. Cowit, Morganville, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 19, 1976, Ser. No. 706,900
Int. Cl.[2] B60C *23/04*
U.S. Cl. 340—58 1 Claim



1. a flat tire indicating device for indicating when a tire has lost at least a predetermined air pressure, said tire having a rim and a tire valve with an externally threaded valve stem having an axis, said flat tire indicating device comprising

a substantially elongated housing having an internally threaded part threadedly coupled to the valve stem of a tire, said housing extending substantially perpendicularly to the axis of the valve stem and substantially symmetrical thereto whereby said housing is positioned along the rim of the tire;

battery means in the housing;

audible alarm means in the housing;

radio transmitter means in the housing;

air-operated switch means in the housing and in operative proximity with the valve stem having an open condition when the tire pressure is above the predetermined air pressure and a closed condition when the tire pressure is reduced to one below the predetermined air pressure, said switch means having movable electrical contact means controlled in position by the pressure of air in the tire and spring biasing means for adjustment to the predetermined air pressure;

circuit means electrically connecting the battery means, alarm means, transmitter means and switch means in a circuit whereby when the switch means is moved to its closed condition the battery means actuates the alarm means and transmitter means; and

radio receiver means for receiving a signal transmitted by the transmitter means thereby indicating that the tire is flat.

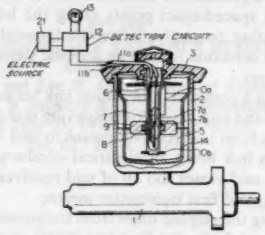
4,037,193
LIQUID LEVEL ALARM APPARATUS FOR A TANK OF A VEHICLE

Hiroshi Uemura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 420,059, Nov. 29, 1973, abandoned.
This application Sept. 4, 1975, Ser. No. 610,239
Claims priority, application Japan, July 24, 1973, 48-82663
Int. Cl.[2] B60T *17/22*
U.S. Cl. 340—59 3 Claims

1. A liquid low level alarm apparatus for a vehicle tank of the type that includes a buoyant member for floating on the liquid in the tank, a permanent magnet carried by the buoyant member, a reed switch positioned vertically in the tank at a predetermined level and having a pair of contacts movable from a first position to a second position in response to proximity of the magnet, an elongated upright case enclosing the switch, the buoyant member slidably engaging the case for guidance thereby in free up and down movement in response to changes of liquid level in the tank, upper and lower stops fixed to the case for limiting the upward and downward movement of the buoyant member to a range that includes a predetermined minimum liquid level, an electric source, and an alarm connected in circuit with the switch and the electric source for actuation when the switch contacts are in a preselected one of the first and second positions, wherein the improvement comprises:

the case and buoyant member being attached to a removable cap for the tank to permit easy removal whenever the tank is refilled;



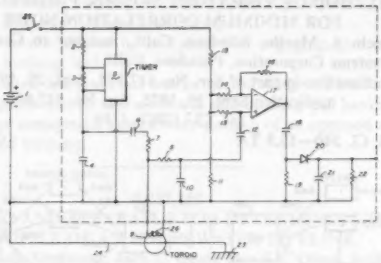
the reed switch and the stops being positioned relative to the predetermined minimum liquid level such that the contacts are closed when the liquid in the tank is above said level and the contacts are open when the liquid in the tank is below said level, and

a detection circuit connected to the switch, the electrical source, and the alarm for causing the alarm to operate when the switch contacts are open.

4,037,194
CURRENT SENSING ALARM CIRCUIT FOR A MOTOR VEHICLE

Willis G. Boyden, and Richard A. Shaw, both of 932 Wash St., Norwood, Mass. 02062

Filed Dec. 17, 1975, Ser. No. 641,662
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—63 7 Claims



1. An alarm circuit for a motor vehicle for sensing the current drawn by the vehicle battery comprising;

a ring of ferromagnetic material having one of the cables associated with the battery coupled therethrough,

at least one turn of wire forming a coil wound about the ring,

oscillator means coupled to the coil or establishing an alternating signal therein of a maximum peak-to-peak magnitude when the battery cable has no current flowing therein,

means including the vehicle battery for providing operating power for the oscillator means,

integrator means coupled from the coil for providing a level signal of a magnitude corresponding to the peak-to-peak magnitude of the alternating signal coupled from the coil,

and means coupled from the integrator means and responsive to a decrease in peak-to-peak voltage across the coil occasioned by current being drawn by the battery for generating an alarm.

4,037,195

VEHICULAR SIGNAL LIGHT CONTROL SYSTEM

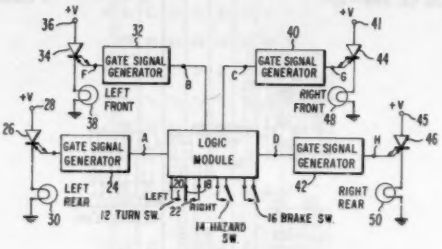
Jack Edward Wojslawowicz, Bayonne, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,172

Claims priority, application United Kingdom, Jan. 26, 1976, 2968/76

Int. Cl.[2] B60Q *1/00*

U.S. Cl. 340—66 9 Claims



1. An electronic signal light control systems for selectively controlling the conduction of current to first through fourth signal lamps at the left front, right front, left rear, and right rear locations of a vehicle, respectively, comprising:

turn switch means normally in a neutral condition, being manually operable to a left turn condition, for operating said control system to blink the first and third signal lamps, or to a right turn condition, for operating said control system to blink said second and fourth lamps;

hazard switch means normally in a neutral condition, being manually operable to an emergency condition, for operating said control system to blink said first through fourth signal lamps;

brake switch means normally in a neutral condition, being operable to a braking condition in response to actuation of the brakes of said vehicle, for operating said control system to turn on said third and fourth signal lamps;

flasher means responsive to the emergency condition of said hazards switch means, for producing a pulse train of alternate logic signals, or responsive to the left or right turn conditions of said turn switch means, for producing the pulse train;

first digital logic network means responsive to the pulse train of said flasher means and to the left turn condition of said turn switch means, for providing left front and left rear lamp drive signals, said first digital logic network means responsive to said pulse train and to the right turn condition of said turn switch means, for providing right front and right rear lamp drive signals, each one of the drive signals having alternate and successive first and second levels of voltage;

second digital logic network means responsive to the emergency condition of said hazard switch means and to the pulse train of said flasher means, for providing concurrently said left front, left rear, right front, and right rear lamp drive signals, each having alternate and successive first and second levels of voltage;

third digital logic network means responsive to the braking condition of said brake switch means, for providing said right and left rear lamp drive signals each at the first level of voltage; and

first through fourth current control means, each having a respective main current path for selectively conducting current to said first through fourth lamps, respectively, and a respective control electrode for receiving said left front, right front, left rear and right rear lamp drive signals, respectively, the main current path of each one of said first through fourth current control means having a relatively high impedance in response to intervals of its respective lamp drive signal that are at the second level of voltage, the main current path of each one of said first through fourth current control means having a relatively low impedance in response to intervals of its respective lamp drive signal that are at the first level of voltage thereby permitting current to be conducted to its associated one of said first through fourth lamps.

4,037,196

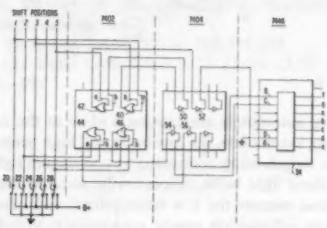
GEARSHIFT POSITION INDICATOR

Steven B. Atkinson, and James E. Reed, both of Cumberland, Md., assignors to Steven B. Atkinson, Cumberland, Md.

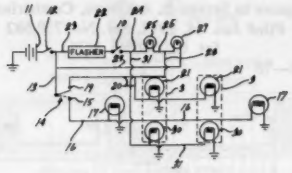
Filed Jan. 14, 1977, Ser. No. 759,582

Int. Cl.[2] B60Q *1/26*

U.S. Cl. 340—70 10 Claims



illuminating said low beam information panels, third light bulbs for illuminating said high beam information panels, an electrical circuit for selectively energizing said first light bulbs including a flasher device and a manually-operated switch series-connected in the circuit of the first light bulbs to cause intermittent illumination of said low beam panels to signal to the driver of the following automobile that the high beams of said



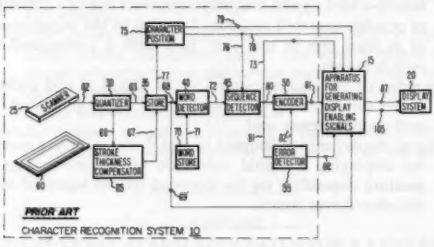
following automobile are causing a glare to the driver of the preceding automobile, the low beam and high beam contacts of said dim switch being connected to said second light bulbs and to said third light bulbs, respectively, so as to illuminate in a continuous manner the low beam information panels and the high beam information panels, respectively, to indicate to the driver of the following automobile which of the high beam and low beam of the preceding automobile are on.

4,037,198

APPARATUS FOR GENERATING DISPLAY ENABLING SIGNALS

Albert M. Essenmacher, Livonia; Thomas R. Krause, Troy, and James Dishaw, Allen Park, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1975, Ser. No. 618,789
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 ED **42 Claims**



1. A method for generating display enabling signals for display, the method being operative to receive a processed data stream as identified from an unprocessed data stream read from characters on an encoded document, comprising the steps of:

a. receiving the unprocessed data stream as read for outputting in one of a real time state and a delay time state a video signal for display when one of a hardware mode and a software mode is selected to respond to a predetermined segment in the unprocessed data stream, and for outputting control signals when in a delay time state indicative of the predetermined segment to be captured in the unprocessed data stream; and

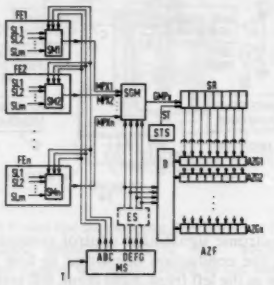
b. obtaining the processed data stream for outputting the processed data stream as a video signal for display in one of a real time state and a delay time state as controlled by delay time state signals thus enabling capture of analogous sections of the unprocessed and processed data streams as read and identified.

4,037,199

APPARATUS FOR SENSING, TRANSMITTING AND DISPLAYING SIGNAL STATES

Günther Rozehnal, Oberhaching, Furth, and Hartmut Wedler, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 18, 1975, Ser. No. 632,912
Claims priority, application Germany, Dec. 20, 1974, 2455055
Int. Cl.[2] H04J *3/00*
U.S. Cl. 340—150 **5 Claims**



1. Apparatus for sensing, communicating and displaying signal states occurring in a plurality of functional units, comprising:

a plurality of signal multiplexer means, one of which is coupled to each said functional unit for sensing the signal states occurring in that functional unit,

group multiplexer means having inputs connected to time division multiplex (TDM) trunks which are connected to outputs of said signal multiplexer means,

a group TDM trunk connected to the output of said group multiplexer means,

multiplexer control means including means for supplying first encoded selection signals to said plurality of signal multiplexer means for selecting signal lines to be sensed such that signal states from corresponding signal lines from said functional units are sensed at the same time and coupled to said group multiplexer means in parallel and including means for supplying second encoded selection signals for the selection of any of said TDM trunks to be connected through said group multiplexer means to said group TDM trunk in any desired sequence, each said TDM trunk being so connected for the duration of a sampling phase,

display means including shift register means for receiving the output of said group TDM trunk, and

timing means for supplying timing pulses to said shift register means, said timing pulses being interrupted upon acceptance of sensed signal states for the duration of a display phase.

4,037,200

BRAILLE DISPLAY SWITCHING MATRIX AND CIRCUIT UTILIZING THE SAME

Terrence V. Cranmer, 523 Pawnee Trail, Frankfort, Ky. 40601

Continuation-in-part of Ser. No. 515,363, Oct. 16, 1974. This application Oct. 28, 1975, Ser. No. 626,257
Int. Cl.[2] H04Q *5/14*
U.S. Cl. 340—166 R **2 Claims**

1. In an improved electronic instrument of the type comprising a digital logic circuit having a decimal digital data source, the improvement of which comprises

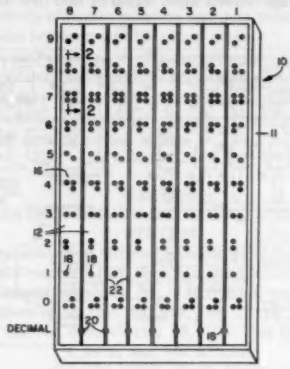
a touch controlled switching matrix comprising

an electrically conductive substrate,

at least one series of raised electrically conductive terminals disposed on said substrate and divided into coded

groups, each of said groups being representative of a different digit in the decimal system from 0 through 9, and

means for insulating said terminals from said substrate in such a manner as to permit any selected one of said groups to be shorted with a finger to said substrate, each



of said groups being electrically connected to said data source,

means for generating an audible signal responsively connected to said substrate for generating said signal when one of said groups bearing a signal from said data source is shorted with a finger to said substrate.

4,037,201

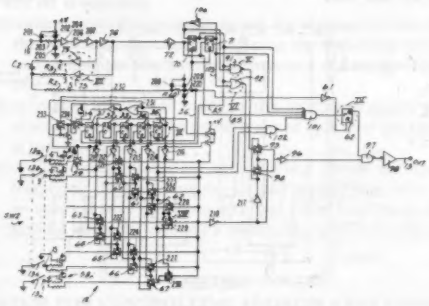
DIGITAL RADIO CONTROL

Colin Barns Willmott, Des Plaines, Ill., assignor to Chamberlain Manufacturing Corporation, Chicago, Ill.

Filed Nov. 24, 1975, Ser. No. 634,504

Int. Cl.[2] H04B *1/00*; **H04Q** *9/00*

U.S. Cl. 340—167 R **10 Claims**



1. A coding system for a transmitter and receiver so that a selected receiver will respond to a particular transmitter comprising a transmitter capable of transmitting a RF signal in a binary code having pulses having time lengths T1 and T2 of different times, means at said transmitter for setting said binary code to a selected combination, a receiver tuned to said RF signal, and including code comparing means receiving the incoming binary code, means at said receiver for setting a binary code to a selected combination supplying an input to said code comparing means, output means actuated by said comparing means if said means for setting a binary code at the transmitter and receiver are set to the same code combination, wherein said means at said transmitter for setting said binary code includes a plurality of two position switches, an encoder including a five stage ring counter with the outputs of each stage connected to the inputs of the following stage and connected to said plurality of two position switches, a flip-flop connected to said ring counter to drive it, an on-off switch connected to said flip-flop circuit, a pair of resistors and a capacitor connected to said flip-flop circuit to control the timing of the transmitted pulses, and an RF oscillator receiving the output of said encoder and keyed to oscillate thereby to cause it to radiate said binary code signal.

4,037,202

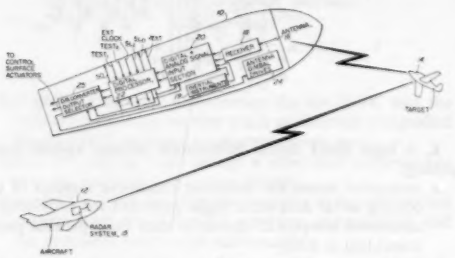
MICROPROGRAM CONTROLLED DIGITAL PROCESSOR HAVING ADDRESSABLE FLIP/FLOP SECTION

John Terzian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 21, 1975, Ser. No. 570,114

Int. Cl.[2] F41G *7/00*; **G06F** *9/12, 11/04, 15/50*

U.S. Cl. 364—200 **4 Claims**



1. In a digital processor wherein a macroinstruction memory stores a repertoire of macroinstructions, each one of such macroinstructions corresponding to a set of microinstructions; a microinstruction memory stores sets of such microinstructions; a register means stores a digital control word; a source decoder means couples data from one of a plurality of data sources to an input bus selectively in accordance with the stored digital control word; an arithmetic section processes data on such input bus in accordance with the stored digital control word and passes such processed data to an output bus; and a destination decoder means couples processed data on such output bus to one of a plurality of destinations selectively in accordance with the stored digital word, the improvement comprising:

a. a first input means connected to the microinstruction memory for coupling a selected one of the microinstructions in parallel form to such register means;

b. a second input means for coupling binary signals in serial form from a source external to the processor to the register means;

c. control signal means for enabling such register means to store, selectively in accordance with a control signal, as the stored digital word, either the microinstruction coupled by the first input means or the binary signals coupled by the second input means;

d. a condition selector means, coupled to the register means and to a plurality of binary signal sources, for coupling one of such binary signal sources onto a condition true line selectively in accordance with the stored digital word; and, including gate means, responsive to the binary signal source on the condition true line, for enabling or inhibiting, selectively in accordance with the binary signal on the condition true line, the processed data on the output bus to pass to the selected one of the destinations; and

e. a plurality of flip/flops; a flip/flop selector having a plurality of inputs coupled to the plurality of flip/flops; and, means for coupling a selected one of such flip/flops through the flip/flop selector to enable such selected one

of such flip/flops to serve as one of the plurality of binary signal sources.

4,037,203

HIGH SPEED DIGITAL INFORMATION STORAGE SYSTEM

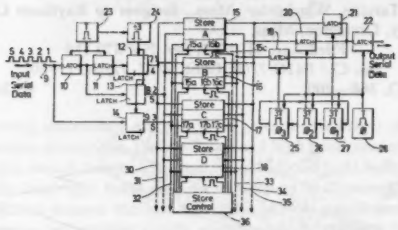
Anthony Donald Stalley, Fleet, England, assignor to Quantel Limited, England

Filed Aug. 27, 1975, Ser. No. 608,082

Claims priority, application United Kingdom, Sept. 3, 1974, 38458/74

Int. Cl.[2] G06F *5/04*

U.S. Cl. 364—900 **6 Claims**



1. A high speed digital information storage system comprising:-

a. converter means for receiving successive samples of incoming serial data on a single path and for providing *n* successive samples of the serial data on *n* parallel paths coincident in time;

b. holding means connected to said converter means for holding the *n* successive samples on said parallel paths for a period *n* times greater than the data repetition period to effectively reduce the data rate prior to storage;

c. storage means connected to said holding means for storing the serial data held in said holding means;

d. clocking means connected to said holding and storage means for clocking in unison said holding means and said storage means at one *n*th of the serial data rate;

e. skewing means connected to said storage means for sequentially holding *n* coincident data samples on *n* parallel paths read out from the storage means; and

f. remultiplexing means connected to said skewing means for receiving the *n* successive samples from the skewing means and for providing the successive samples on a single path.

4,037,204

MICROPROCESSOR INTERRUPT LOGIC

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale; Anthony E. Kouvoussis, Phoenix, all of Ariz.; Rodney H. Orgill; Charles Peddle, both of Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 519,150, Oct. 30, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,290

Int. Cl.[2] G06F *9/18*

U.S. Cl. 364—200 **2 Claims**

1. A microprocessor comprising:

a data bus means for transferring digital information;

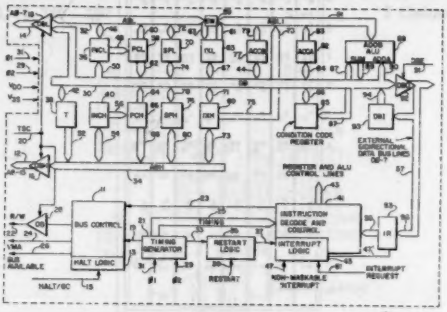
an interrupt request input conductor for conducting an interrupt request input signal representative of an interrupt request;

instruction register means coupled to said data bus means for temporarily storing any one of a plurality of software instructions, including a first instruction having a fixed code, received by said data bus means;

gating means for operatively coupling said data bus means to said instruction register means;

instruction decode means responsive to the contents of said instruction register means for controlling execution of said instruction;

interrupt means responsive to both said interrupt request input signal and to said first instruction coupled to said gating means for producing a signal for inhibiting loading of the next instruction to be executed in response to either said interrupt request input signal or said first instruction; and



said gating means including means responsive to said signal coupled to said instruction register means for forcing a second code having a plurality of bits which are the same as corresponding bits of said first code into said instruction register means in response to said interrupt request input signal.

4,037,205

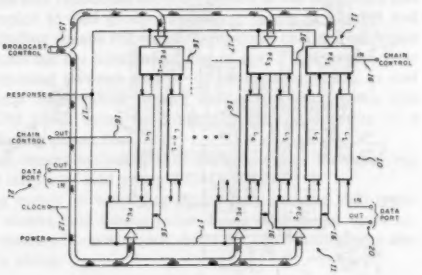
DIGITAL MEMORY WITH DATA MANIPULATION CAPABILITIES

Murray Edelberg, Carlisle, and Lloyd R. Schissler, Jamaica Plain, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,685

Int. Cl.[2] G06F *1/00*

U.S. Cl. 364—900 **23 Claims**



1. Digital memory apparatus for storing and processing digital data comprising

a plurality of circulating storage loop means for storing and circulating said digital data therein,

a plurality of data processing circuit means,

each said data processing circuit means being serially coupled in each of two said circulating storage loop means,

each said circulating storage loop means being serially coupled through two said data processing circuit means at different points of said loop means respectively, and

means for coupling data manipulation control signals including a mode defining signal and key field defining signals to said plurality of data processing circuit means,

each said data processing circuit means including compara-

tor means responsive to said data manipulation control signals and to said digital data circulating in at least one of said two storage loop means associated therewith for performing comparisons with respect to said digital data in accordance with said control signals and loop control means coupled to said comparator means and serially coupled in said two loop means associated therewith for selectively effecting isolating and data interchanging connections between said two loop means,

wherein said data processing circuit means performs a plurality of data manipulation operations with respect to said digital data in response to said data manipulation control signals as said digital data serially circulates through said data processing circuit means.

4,037,206

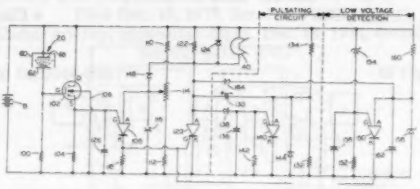
IONIZATION SMOKE DETECTOR AND ALARM SYSTEM

John Dobrzanski, New Britain; Edward Boyd Gardner, Bloomfield, and Ernest V. Hart, West Hartford, all of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Continuation of Ser. No. 542,914, Jan. 22, 1975, which is a division of Ser. No. 409,647, Oct. 25, 1973. This application Apr. 9, 1976, Ser. No. 675,510

Int. Cl.[2] G08B *17/10, 19/00*

U.S. Cl. 340—237 S **11 Claims**



1. A non-latching, pulsating smoke alarm system employing an ionization chamber as the sensing element and a switching device responsive to the sensing element for turning the alarm on and off comprising:

coupling means interposed between the sensing element and the switching device for triggering the switching device and turning the alarm on in the presence of a smoke condition;

deactivating means for resetting the switching device and shutting the alarm off a predetermined time after the alarm is turned on; and

recycling means including the coupling means for again triggering the switching device and turning the alarm on an interval after the alarm is turned off in response to the sensing element detecting a continuing smoke condition.

4,037,207

SYSTEM FOR CONTROLLING ADDRESS KEYS UNDER INTERRUPT CONDITIONS

Richard Eugene Birney; William Steese Osborne, and Lynn Allan Graybiel, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,226

Int. Cl.[2] G06F *9/20*

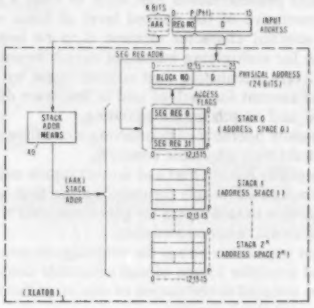
U.S. Cl. 364—200 **9 Claims**

1. An interrupt addressability control system for connecting an addressability used by a supervisor program to an addressability being used by a processor when it is interrupted, comprising

an address key register (AKR) in a processor for storing a plurality of address keys, the AKR having at least a source operand key section and an instruction fetch key section, key selection means for selecting one section of the AKR and outgating an address key stored therein as an active address key (AAK),

check interrupt generating means in the processor,

means for storing each processor AAK as a last AAK, the last AAK defining an interrupted addressability occuring upon an interrupt signal being provided by the check interrupt generating means,



key gating means for transferring the last AAK into the source operand key section when an interrupt is signalled by the check interrupt generating means, and

means for loading from storage a supervisor program key into the instruction fetch key section,

whereby the processor then has available in the address key register both the supervisor program addressability and the processor interrupted addressability.

4,037,208

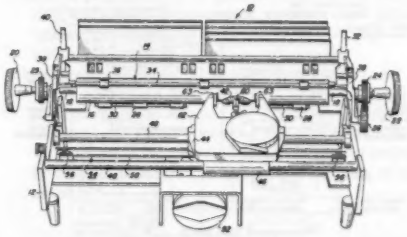
HAMMER INTENSITY SELECTION APPARATUS FOR SERIAL PRINTER

Alfred G. Osterlund, Los Gatos, and Frank D. Ruble, Fremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,949

Int. Cl.[2] G06F *3/12, 9/16;* **B41J** *9/00*

U.S. Cl. 364—900 **10 Claims**



1. In a serial printer comprising a carriage, a print member rotatably mounted to said carriage and including a plurality of character elements of a predetermined font style, drive means coupled to said print member for rotating said print member to a desired rotational position order to place a selected character element at a printing position adjacent a record medium to be printed upon, print hammer means mounted to said carriage and capable when enabled of impacting the character element located at said printing position with a desired level of force, and hammer control apparatus coupled to said print hammer means for enabling said print hammer means when said selected character element has been rotated to said desired rotational position, said hammer control apparatus comprising:

means responsive to a first signal representative of said selected character element to be impacted for generating a

second signal proportional to a desired level of force with which said selected character element is to be impacted by said print hammer means when said plurality of character elements are defined in any one of at least two different font styles, one of which being said predetermined font style;

means coupled to said means for generating a second signal for multiplying said second signal by a constant identifying said predetermined font style to form a third signal representative of the desired level of force with which said selected character element is to be impacted; said means for multiplying including switch means capable of selectively attenuating said second signal by a predetermined amount for each of said at least two different font styles; said switch means including,

a manually operable switch having a common contact and at least two selectable contacts,

an amplifier having first and second inputs and an output,

first impedance means for coupling the first input of said amplifier to said means for generating said second signal and to said common contact,

second impedance means for coupling the second input of said amplifier to one of said selectable contacts, and

means coupled to the output of said amplifier for generating said third signal;

means coupled to said print member for detecting when said selected character element has been rotated to said desired rotational position; and

means responsive to such detection for coupling said third signal to said print hammer means thereby enabling said print hammer means to impact said selected character element with said desired level of force.

4,037,209

DATA PROCESSING SYSTEM FOR CONVERTING FROM LOGICAL ADDRESSES TO PHYSICAL ADDRESSES

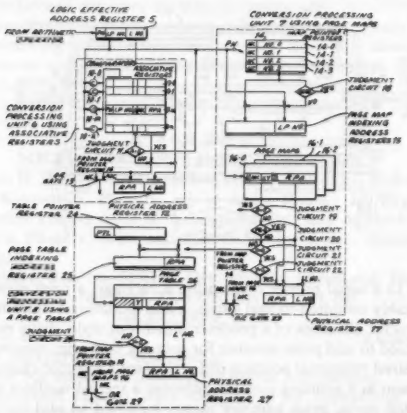
Ichiro Nakajima; Isao Sanaka; Tsuginori Takeda, all of Kawasaki; Hiroyuki Koarai, Sagamihara; Toru Ando, Kawasaki; Tetsuhiko Ifuku, Yokohama, and Hatsuo Murano, Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Nov. 24, 1975, Ser. No. 634,844

Claims priority, application Japan, Nov. 30, 1974, 49-138067

Int. Cl.² G06F *7/04*

U.S. Cl. 364—200 **2 Claims**



1. A data processing system for converting from logical addresses to physical addresses, said data processing system having address converting means for converting logical addresses of a program to physical addresses of a memory device, said memory device having a plurality of memory areas, said address converting means being commonly utilizable for a plurality of applications with desired corresponding logical addresses and capable of providing access to the memory device in accordance with physical addresses obtained by said address converting means, said address converting means comprising first address converting means having entries corresponding to the logical addresses of the program on a 1:1 basis, said first address converting means storing physical addresses corresponding to said logical addresses, each entry of the first address converting means having data indicating whether or not the memory area of the memory device corresponding to physical addresses stored in said entry is commonly used for applications, and second address converting means having unique entries each commonly selected by any one of the logical addresses corresponding to each memory area of the memory device commonly used, said second address converting means storing physical addresses corresponding to the memory areas of said memory device commonly used, an entry of the second address converting means being indexed by a physical address stored in an entry of the first address converting means, which entry of the first address converting means includes data indicating that the corresponding memory area is commonly used.

4,037,210

COMPUTER-PERIPHERAL INTERFACE

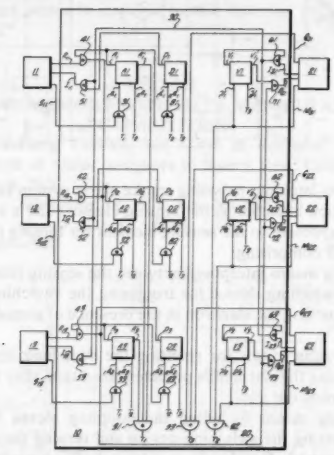
Richard Stanton Sharp, Santa Barbara, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 392,861, Aug. 30, 1973, abandoned.

This application Jan. 29, 1976, Ser. No. 653,497

Int. Cl.² G06F *3/00, 15/16*

U.S. Cl. 364—900 **4 Claims**



1. In association with a plurality of processing units and a plurality of peripheral units, each of said processing units including means for emitting an access-request signal and the address of a particular peripheral unit and each of said peripheral units including means for emitting a ready-to-transmit signal in response to receipt of an address corresponding thereto followed by information signals and a transmit-complete signal, an interface unit comprising:

a read bus for transmitting signals from a selected processing unit to one or more of said peripheral units;

a write bus for transmitting signals from a selected peripheral unit to a selected processing unit;

first means for generating a not-busy signal only when said write bus is not in use and regardless of whether any use is currently being made of said read bus, said first means further including means jointly responsive to said not-busy signal and to an access-request signal from a selected processing unit for connecting only said selected processing unit to said write bus for transmission of a peripheral address provided thereby;

second means for connecting each peripheral unit which is not in use to said write bus for receiving the peripheral address transmitted by a selected processing unit, said second means being responsive to a ready-to-transmit signal from the selected peripheral unit corresponding to said peripheral address for disconnecting said selected processing unit and only said selected peripheral unit from said write bus and for connecting only said selected peripheral unit and only said selected processing unit to said read bus, thereby providing for transmitting information signals from said selected peripheral unit to said selected processing unit along said read bus, while freeing said write bus for connection thereto of another processing unit for transmission of an access-response-signal provided thereby to the peripheral units remaining connected to said write bus; and

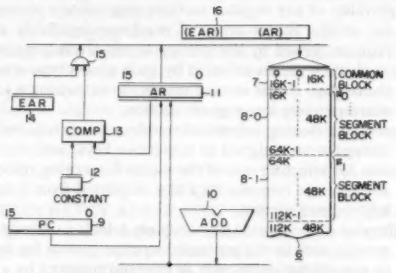
third means responsive to a transmit-complete signal from said selected peripheral unit for disconnecting said selected processing unit and said selected peripheral unit from said read bus and for re-connecting said selected peripheral unit to said write bus.

4,037,211

ADDRESS EXTENDING CONTROL UNIT

Hiroaki Ikuta, Yokohama; Yoshikazu Naruke, Kawasaki; Yoshio Nagasawa, Tokyo, and Masanori Yakushi, Kawasaki, all of Japan, assignors to Panafacom Limited, Japan

Filed Dec. 18, 1975, Ser. No. 641,812
Claims priority, application Japan, Dec. 18, 1974, 49-145417
Int. Cl.[2] G11C *8/00*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system provided with an address register having a content of fixed number of bits and a memory having a memory storage area larger than the storage area addressable with the content of said address register; an address extending control unit for enabling the addressing of a predetermined address in a predetermined area of said memory, as selectively indicated by a corresponding data input to said control unit, said control unit comprising:

comparing means connected to said address register for comparing the content thereof in magnitude with a settable predetermined value and for providing an output signal when the content of said address register is larger than said settable predetermined value;

an address extending address register responsive to said corresponding data input to said control unit for holding a content indicating said selected predetermined area of the memory; and

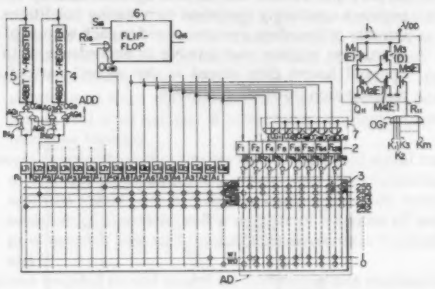
control means connected to said address register, said comparing means and said address extending register, and responsive to said output signal for appending the content of the address extending address register to the content of the address register so as to provide as a control output an increased number of bits greater than said fixed number, whereby said predetermined address in said predetermined area of the memory is selected.

4,037,212

INFORMATION PROCESSING SYSTEM

Kosei Nomiya, Tokyo; Takao Tsuiki, Kokubunji; Takeshi Kobayashi, and Shinkichi Hotta, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 20, 1976, Ser. No. 650,764
Claims priority, application Japan, Jan. 31, 1975, 50-12581
Int. Cl.[2] G11C *7/00, 17/00*
U.S. Cl. 364—200 **9 Claims**



1. In an information processing system including:

a memory in which a microprogram for processing information is stored;

an address register for designating the addresses of program information stored in said memory;

a plurality of storage circuits coupled to said memory and selectively receiving program information stored in said memory; and

means, coupled to said storage circuits and said address register, for setting the contents of said storage circuits at prescribed values upon the turn-on of said system;

the improvement wherein said means comprises

first means for generating a first prescribed signal upon the turn-on of said system,

second means, coupled to said first means and said address register, for coupling said first prescribed signal to a plurality of selected bit positions of said address register corresponding to a plurality of selected addresses of said memory, and

wherein said plurality of selected addresses of said memory have been programmed to store said prescribed values for setting the contents of said storage circuits, and

third means, coupled to said address register, for selectively addressing individual ones of the bit positions of said plurality of selected bit positions of said address register, and thereby causing the contents of the individual ones of said selected addresses of said memory to be coupled to respective ones of said plurality of storage circuits.

4,037,213

DATA PROCESSOR USING A FOUR SECTION INSTRUCTION FORMAT FOR CONTROL OF MULTI-OPERATION FUNCTIONS BY A SINGLE INSTRUCTION

James Damon Atkins, Chapel Hill; Charles Allen Murphy, Raleigh, both of N.C., and Lewis Everett Stotts, Kennesaw, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

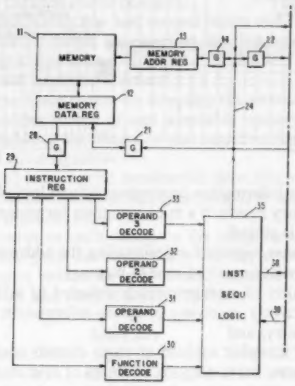
Filed Apr. 23, 1976, Ser. No. 679,583
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—200 **3 Claims**

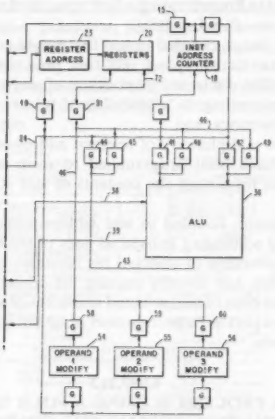
1. In a data processor of the type having a storage device comprising a plurality of addressable storage locations for retaining instructions and operands and a plurality of registers for storing the addresses of operands stored in said device, the combination of

a multi-section instruction register connected to receive an

instruction from said storage device for control of said processor, said instruction including a first part to identify the function to be performed by said processor, a second part to specify the lengths of the operands to be processed, a third and a fourth part to identify two of said registers storing operand addresses, a fifth part and a sixth part of said instruction, each associated with one of said third and fourth parts to control modification of the address data in said identified operand address registers and a last part to identify still another one of said operand address storing registers containing operation terminating conditions,

a plurality of decoders, one connected to each section of said instruction register and settable in accordance with the operand length data stored in the second part of said multi-section instruction register,





an instruction sequencing unit connected to the decoder for said first part of said instruction and operating to control the functions of said data processor,

means connected to said decoders for said third and said fourth parts of said instruction to select said two registers to determine the storage locations of a pair of operands,

an address modification unit for each of said identified operand address registers and for said identified register containing operand terminating conditions, said modification units for said operand address registers being connected to transfer address data to and from the associated one of said registers, and

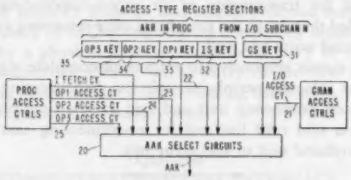
control connections from each of said decoders for said fifth, sixth, and last parts of said instruction register to the associated one of said modification units to determine the modification to be performed therein.

4,037,214

KEY REGISTER CONTROLLED ACCESSING SYSTEM

Richard Eugene Birney; Michael Ian Davis, and Robert Allen Hood, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,984
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **7 Claims**



1. A protected storage system having a processor using a plurality of storage protect keys, the processor comprising

storage access sensing means in the processor for sensing different types of machine-identifiable storage requests, including means for sensing instructions access requests for generating an instruction access type signal, and means for sensing operand access requests for generating at least one type of operand access signal,

a plurality of key register sections respectively corresponding to the access types of machine-identifiable storage requests sensed by the storage access sensing means,

key selection means actuated by each access type sensed by the storage access sensing means for outputting a key in a corresponding key register section,

means for storing relocatable addresses corresponding to storage areas assigned to respective keys, and

means for selecting one of the means for storing relocatable addresses in response to a key outputted from a selected key register section,

whereby the outputted key uniquely selects a corresponding storage area in the protected storage system for fetching or storing the instruction or operand required by a corresponding request for storage access.

4,037,215

KEY CONTROLLED ADDRESS RELOCATION TRANSLATION SYSTEM

Richard Eugene Birney; Michael Ian Davis; Robert Allen Hood; Lynn Allan Graybiel, all of Boca Raton, Fla.; Samuel Kahn, Mountain View, Calif., and William Steese Osborne, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,222
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 **4 Claims**

1. A protected relocatable storage system using a plurality of address keys assignable in any order to areas of physical storage, the physical storage areas being assignable to the address keys to comprehend up to all of an overall physical main memory used by the storage system, comprising

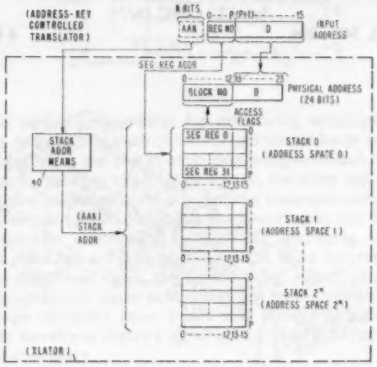
storage access request means in a processor for sensing and signalling each type of storage access request made by the processor, the request type signals including an instruction fetch signal and at least one type of operand fetch signal,

key register means having at least an instruction address key section and an operand address key section,

key selection means being actuatable by the instruction fetch signal or the operand fetch signal when a storage access is

granted for a requesting signal to outgate the content of a selected key register section in the key register means as an active address key,

address translation means receiving the active address key as an implicit high-order part of a logical machine address for a storage access request, which logical machine address comprises the active address key concatenated with an explicit program-derived logical address which is either an instruction counter logical address or a logical operand address, the address translation means converting the logical machine address into a physical storage address



for locating an addressable unit in a physical storage area identified by the active address key,

physical storage means accessing the addressable unit at the physical storage address,

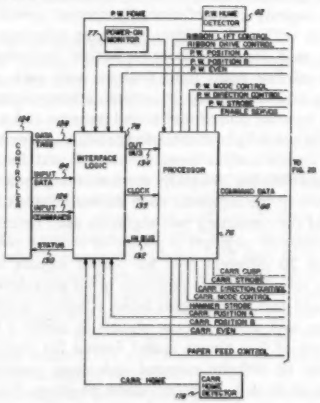
whereby changing the key in any key register section changes the location in the physical storage means of all addressable units assigned to the key without changing the logical location of any instruction in any program or any operand address specified in an instruction, and whereby the keys are transparent to the program-derived logical addresses.

4,037,216

POSITION RETRY APPARATUS FOR SERIAL PRINTER

Louis H. Chang, and John C. Fravel, both of San Jose, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,950
Int. Cl.² G06F *3/12, 9/16;* B41J *9/00*
U.S. Cl. 364—900 **16 Claims**



1. In a serial printer comprising a carriage, a print member rotatably mounted to said carriage and including a plurality of character elements, drive means coupled to said print member for rotating said print member in a desired direction and at a desired speed, and control apparatus coupled to said drive means fo generating a control signal to control the direction and speed of rotation of said print member, said control apparatus comprising:

means coupled to said print member for generating a first signal indicative of the rotational movement of said print member;

means responsive to a second signal indicative of a command to position the print member at a first predetermined rotational position for applying a predetermined control signal to the drive means to rotate the print member in a predetermined direction and at a predetermined speed;

means operatively associated with said print member for generating a third signal each time a predetermined portion of said print member is rotated past a predetermined reference location;

means coupled to said means for generating a first signal and to said means for generating a third signal for comparing said first signal with a predetermined third signal representative of a predetermined number of rotations of said print member past said predetermined reference location; and

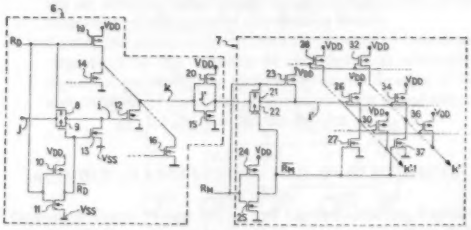
means coupled to said means for comparing and responsive to said first and predetermined third signals bearing a first relationship for disabling said means for applying in order to stop the print member at said first predetermined rotational position, and responsive to said first and third predetermined signals bearing a second relationship for enabling said means for applying to continue to apply said predetermined control signal to said drive means in order to continue to rotate said print member in said predetermined direction and at said predetermined speed.

4,037,217

READ-ONLY MEMORY USING COMPLEMENTARY CONDUCTIVITY TYPE INSULATED GATE FIELD EFFECT TRANSISTORS

Giuseppe Savaresc, Antibes, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 12, 1975, Ser. No. 612,968
Claims priority, application France, Sept. 19, 1974, 74.31620
Int. Cl.² G11C *17/00, 11/40*
U.S. Cl. 340—173 SP **7 Claims**



1. A read-only semiconductor memory comprising insulated gate field effect transistors and including a decoder matrix and a storage memory matrix, wherein said decoder matrix and said storage memory matrix each comprises complementary conductivity type insulated gate field effect transistors;

said decoder matrix including a plurality of intersecting rows and columns with each intersection defined by a single insulated gate field effect transistor said intersection transistors all having the same channel conductivity type, each row of said decoder matrix including a plurality of said first transistors and complementary conductivity type insulated gate field effect transistor gate means connecting the gates of said row transistors to a respectively corresponding address input, means connecting an interrogation input for said decoder matrix directly to the gate of

one of the transistors of said transfer gate means and means including a complementary conductivity type insulated gate field effect transistor inverter means for connecting said interrogation inputs to the gate of the other transfer gate transistor; each said row transistor also forming part of a different column of said decoder matrix and including a channel connected in common with the channels of other transistors of said column, said other transistors forming part of the other rows of said decoder matrix; for each column of said decoder matrix a single precharge insulated gate field effect transistor of opposite channel conductivity type from that of said intersection transistors connecting the channels of the transistors of that said column to a d.c. supply line; and

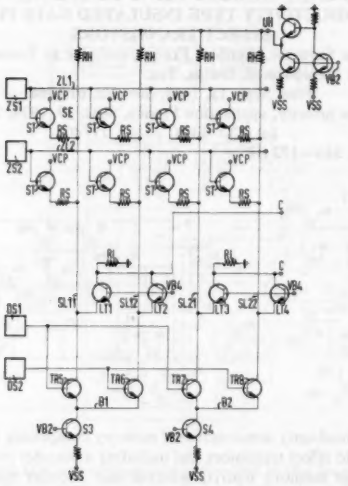
means connecting the columns of said decoder matrix to respective rows of said storage memory matrix, said storage memory matrix comprising a plurality of intersecting rows and columns with each intersection defined by a single insulated gate field effect transistor, said storage memory matrix intersection transistors all having the same conductivity type, and for each column of the storage memory matrix a single load transistor of opposite conductivity type from that of said storage memory matrix intersection transistors.

4,037,218

READ ONLY MEMORY MODULE

Ingo Gröeger, and Jüergen Scharbert, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 23, 1976, Ser. No. 651,909
Claims priority, application Germany, Feb. 7, 1975, 2505245
Int. Cl.[2] G11C *13/00*
U.S. Cl. 340—173 R **2 Claims**



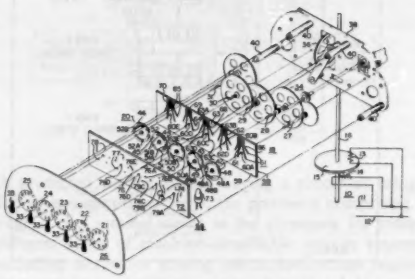
1. A read only memory module comprising a plurality of row lines, a plurality of column lines intersecting said row lines, a plurality of storage elements connecting the intersections of respective row lines and column lines, said row lines and column lines having potentials selectively applied thereto for reading information from said storage elements, a plurality of auxiliary resistors each connected to a respective column line, and an auxiliary voltage source connected to each of said auxiliary resistors, the value of the auxiliary voltage of said auxiliary voltage source being more negative than the voltage on a selected row line during a reading operation, and the value of each auxiliary resistor being sufficiently large that the current on a selected column line flowing via the respective auxiliary resistor and the selected column line is small with respect to the read current flowing in the column line.

4,037,219

METER DIAL ENCODER FOR REMOTE METER READING

Arthur M. Lewis, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1975, Ser. No. 645,165
Int. Cl.[2] G08C *19/16*
U.S. Cl. 340—204 **4 Claims**



1. An optical meter dial encoder for a multi-dial register driven by a meter movement with each dial having 10 numerical markings, said encoder comprising:

plural pointer shafts each extending through one of said dials, said shafts being interconnected for continuous rotations in a progressively increasing ratio of one-to-10;

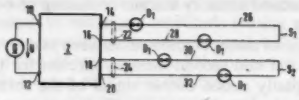
plural code discs each including a single circular track pattern wherein each one of the code discs is connected to a separate one of the pointer shafts for continuous rotation therewith, each single track pattern being defined by four alternately opaque and transparent arcuate code segments, the pattern segments being symmetrically disposed so as to commence at angles of **0°**, **54°**, **108°** and **234°**, respectively, around each pattern; and

an optical pattern sensing assembly including plural groups of five equally circumferentially spaced optical sensing positions with each position having an associated optical sensor, said sensing assembly further including plural groups of five point light sources with each group of sensing positions being in optical communication with both a separate one of said plural patterns and a separate group of point light sources for producing five bit binary coded sensor output signals, each of said four pattern segments defining 20 equally arcuate binary indicia sectors with two of the segments each defining three of the sectors and the remaining two segments each defining seven of the sectors adjacent a group of sensing positions to produce 20 different five bit output signals indicating twenty equally arcuate positions of an associated pointer shaft, said pattern segments being effective to alternately produce said sensor output signals in either a two or a three out of five binary coded format for distinguishing between 10 definite numeral indicating positions of a pointer shaft and 10 intermediate positions thereof, and said pattern segments being further effective to produce a change at only one of the sensors of a group when the associated pattern is moved through angular increments equal to one of the indicia sectors.

4,037,220

CIRCUIT ARRANGEMENT FOR MONITORING INTERRUPTIONS IN TWO CLOSED-CIRCUIT LOOPS

Hartwig Beyersdorf, Konsulweg 29, Scharbeutz, Germany (D-2409)

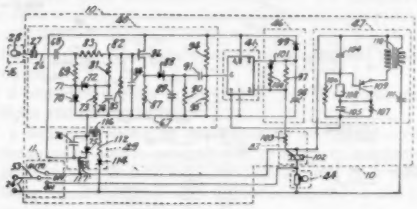
Filed Oct. 7, 1975, Ser. No. 620,276
Claims priority, application Germany, Oct. 31, 1974, 2451907
Int. Cl.[2] G01D *4/10;* G01R *31/02*
U.S. Cl. 340—256 38 Claims

1. A circuit arrangement for monitoring interruptions of circuit continuity in each of two closed-circuit loops laid in at least one cable, one end of each loop being provided for connection to one pole of a voltage source, the other end of each loop being connected, via a respective resistance network to the other pole of the voltage source, the networks also deriving potentials for controlling an electronic switching element, which potentials are derived in the event of an interruption in at least one of said loops, and the electronic switching element having its control signal path connected between points in the resistance networks from which said control potentials are derived thereby to derive a signal indicative of interruptions of circuit continuity.

4,037,221

TOUCH CONTROLLED SWITCH ASSEMBLY

Jerry L. Alexander, 1596 13th Ave., Village of St. Paul Park, Minn. 55071

Continuation-in-part of Ser. No. 470,537, May 16, 1974, Pat. No. 3,965,465. This application June 6, 1975, Ser. No. 584,251
Int. Cl.[2] G08B *13/26;* H01H *36/00*
U.S. Cl. 340—258 C 14 Claims



1. A switch assembly including:

switch means having an input and adapted for being switched from a first state to a second state when a triggering signal having an intensity exceeding a predetermined level is applied at said input;

a network coupled to the input of said switch means and adapted to electrically couple the input of said switch means to a touch plate such that when said switch assembly is energized by a conventional alternating electrical power source, there is at said touch plate an incoming signal comprising a continuously received alternating electrical noise component which may be of constant or slowly changing amplitude depending upon the ambient conditions at the touch plate and which incoming signal is instantaneously changed when an individual contacts the touch plate, wherein said network comprises:

means adapted for referencing the incoming signal to a predetermined reference voltage;

means adapted for integrating a portion of said referenced incoming signal having a time constant such that there is produced a direct current signal of one polarity relative to said predetermined reference voltage and of slightly less potential than the peak to peak potential of the incoming signal when the incoming signal is of constant or slowly changing amplitude such as is produced by the electrical noise component alone and such that a disproportionately small change is produced in the direct current signal when the incoming signal is instantaneously changed in potential such as is caused by an individual's contacting the touch plate;

means for summing said referenced incoming signal and said direct current signal to produce a summed signal; and

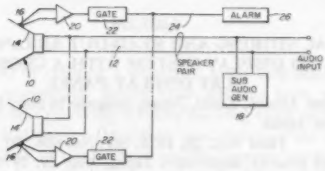
means for passing as a triggering signal to said switch means only instantaneous changes in portions of said summed signal of polarity opposite said one polarity.

4,037,222

SUPERVISION OF TRANSDUCERS

Elias E. Solomon, Duxbury, Mass., assignor to Gulf & Western Manufacturing Company (Systems), New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 618,760
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—261 15 Claims



1. A system for monitoring the operation of at least one loud speaker means which has connected thereto an input signal line upon which audio signals are impressed for transmission to the speaker means, said system comprising:

means for coupling an alternating supervisory signal on the input signal line,

vibration sensitive transducer means directly responsive to mechanical deflections of the cone of the speaker and means for mounting the transducer means to the cone of the speaker means whereby the transducer means is responsive to the vibrations of the speaker means for providing an electrical alternating signal corresponding to the frequency of vibration of the speaker means,

and detection means coupled from the transducer means and responsive to the absence of the electrical alternating signal for generating an alarm condition indicative of the inoperability of the speaker means or input signal line.

4,037,223

AUDIBLE ALARM SYSTEM FOR AN ELECTRICAL OUTLET

Domenick Tucci, Mount Kisco, and Lewis Cantalupi, Yonkers, both of N.Y., assignors to Tucci Corporation, Harrison, N.Y.

Filed Apr. 1, 1975, Ser. No. 564,131
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—280 8 Claims

1. An audible alarm system for electrical outlets, comprising:

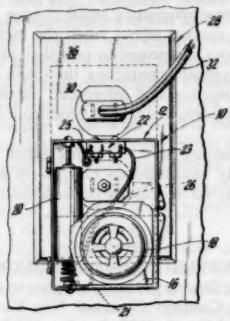
a housing dimensioned to prevent access to the plug socket of an electrical outlet upon mounting thereon;

means coupled to said housing for insertion into the plug socket for mounting said housing on said plug socket;

alarm means in said housing for providing an audible alarm; and

pressure responsive switch means having an outwardly extending portion capable of being engaged and depressed by the electrical outlet upon mounting onto the plug socket to open the circuit to the alarm means and deactivate the same and during withdrawal of said housing from

the plug socket, said outwardly extending member moving to close said pressure responsive switch means and



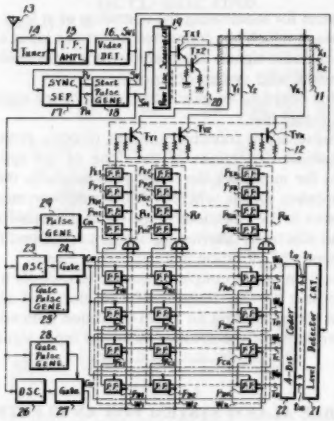
therefore the circuit to the alarm means to provide an audible alarm.

4,037,224

SIGNAL STORING AND READ-OUT ARRANGEMENT OF VIDEO DISPLAY SYSTEM WITH A CROSSED-GRID FLAT DISPLAY PANEL

Yoshifumi Amano, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1975, Ser. No. 606,107
Claims priority, application Japan, Aug. 29, 1974, 49-99236
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **2 Claims**



1. A video display system comprising:

A. a display panel including a group of first parallel electrodes and a group of second parallel electrodes substantially perpendicular to said first electrodes;

B. a group of first driving circuits connected to said first parallel electrodes respectively;

C. a group of second driving circuits connected to said second electrodes respectively;

D. a video signal source for supplying a video signal;

E. a sync. separator connected to said video signal source for separating horizontal and vertical synchronizing signals from said video signal;

F. means supplied with said horizontal synchronizing signals for driving said first driving circuits sequentially in synchronism with said horizontal synchronizing signals;

G. signal level detecting means connected to said video signal source for detecting the level of the video signal and providing a corresponding digitally coded output signal of n bits where n is a positive integer;

H. a group of first memory circuits connected to said second driving circuits respectively, each of the first memory circuits including n-bit memory devices serially connected to form a shift register, and having a single input terminal and a single output terminal which is connected to the corresponding one of said second driving circuits;

I. a group of second memory circuits connected to the input terminals of said first memory circuits respectively, each of the second memory circuits consisting of n-bit memory devices;

J. first control means connected between said level detecting means and said second memory circuits for transmitting the digitally coded output signal of the former sequentially to the latter during an effective picture period of a horizontal scanning period;

K. second control means connected between said first and second memory circuits for transmitting signals from the latter to the former in a short interval after said effective picture period and prior to the next effective picture period; and

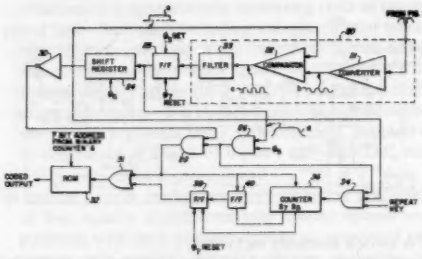
L. third control means connected with said first memory circuits for reading out signals of the first memory circuits from lower bits to higher bits with different intervals corresponding to the weight of the digitally coded signal and driving the second driving circuits with the signals read out from the first memory circuits.

4,037,225

KEYBOARD ENCODING SYSTEM WITH ELECTRONIC HYSTERESIS

Wilbur E. DuVall, Victorville, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1975, Ser. No. 634,976
Int. Cl.[2] G08C *1/00*
U.S. Cl. 340—365 E **1 Claim**



1. A switching device encoding system comprising:

a voltage source,

an array of switching devices, each of which has a low impedance in a closed state and a high impedance in an open state,

signal amplitude sensing means,

first means coupled to said array, to said voltage source and to said signal amplitude sensing means for continuously, cyclically addressing in a predetermined sequence each switching device of said array such that each of said switching devices of said array couples said voltage source to said signal amplitude sensing means, whereby a signal of one amplitude is supplied to said signal amplitude sensing means when a closed switching device is coupled to said voltage source and said signal amplitude sensing means and a signal of a different amplitude is supplied to said signal amplitude sensing means when an open switching device is coupled to said voltage source and said signal amplitude sensing means,

said signal amplitude sensing means providing an output

signal of a high value when the input signal supplied thereto is above a certain amplitude,

storage means coupled to said signal amplitude sensing means for storing the state of each of said switching devices during the previous scan cycle,

feedback means coupled between said storage means and said signal amplitude sensing means for increasing the sensitivity of said signal amplitude sensing means if a switching device currently being sensed was in a closed state the previous scan cycle, and

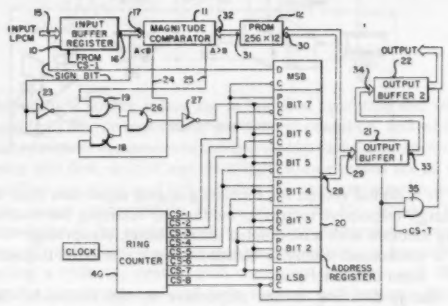
logic means coupled to the output of said storage means and to the output of said signal amplitude sensing means, said logic means providing an output signal only when the output of said storage means and the output of said signal amplitude sensing means are different.

4,037,226

PULSE CODE MODULATION COMPRESSOR

William L. Betts, and Robert T. Greene, both of St. Petersburg, Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 7, 1976, Ser. No. 647,298
Int. Cl.[2] H04L *3/00*
U.S. Cl. 340—347 DD **5 Claims**



1. A pulse code modulation compressor for companding pulse code modulation signals having a sign bit, comprising:

A. a magnitude comparator for comparing pulse code modulation signals having first and second inputs and decision outputs;

B. a first shift register connected to said first comparator input and having an input;

C. a memory having an address input and a pulse code modulation output programmed to convert compressed pulse code modulation signals to linear pulse code modulation signals, said memory output connected to said second comparator input;

D. a second shift register having a single stage set of bit cells equal in number to the number of bits in a compressed pulse code modulation word and a sign bit cell to be processed, said word bit cells connected to said comparator decision outputs;

E. a logic circuit connected between said magnitude comparator and said second shift register comprising;

1. a first NAND gate having one input terminal connected to the sign bit at said magnitude comparator first input and another input connected to one said magnitude comparator decision output;

2. a second NAND gate connected through an inverter to said sign bit at said magnitude comparator first input and having another input connected to another of said magnitude comparator decision outputs;

3. a third NAND gate having an input connected to said first NAND gate and a second input connected to said second NAND gate and having an output connected to each bit cell of said address register except the most significant bit cell through a second inverter; and

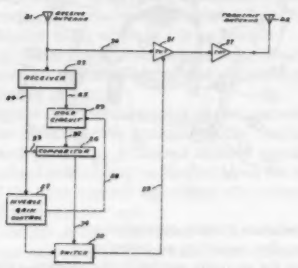
F. clock means connected to said second register to provide a series of successively more accurate memory address pulse code modulation words in said second register.

4,037,227

CONTROLLED DECEPTION JAMMING DEVICE

Charles R. Kline, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1966, Ser. No. 541,856
Int. Cl.[2] G01S *7/38;* H04K *3/00*
U.S. Cl. 343—18 E **3 Claims**



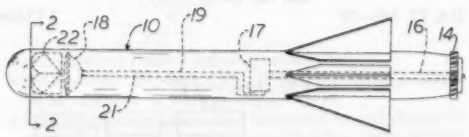
1. A method of creating a deceptive angle indication in a radar of the sequentially lobing angle tracking type, which method comprises: receiving the lobe tracking radar signals at a normal level; detecting the lobing modulation of the radar; shifting the phase of the modulation 180 degrees; retransmitting at a high level the radar signal with the phase shifted modulation; attenuating the initially received radar signal a predetermined amount; storing the attenuated signal; comparing over a period of time the stored signal level with the signal level being received; terminating the retransmitting of the phase shifted signals when the stored signal level and the received signal levels are approximately equal; and beaconing the received radar signal after the termination of transmitting the phase shifted signal.

4,037,228

SYSTEM FOR AUGMENTING THE VISUAL AND RADAR CHARACTERISTICS OF AN AIRBORNE TARGET

Walter B. Pearson, Birmingham, Ala., assignor to Hayes International Corporation, Birmingham, Ala.

Filed Apr. 20, 1976, Ser. No. 678,615
Int. Cl.[2] H01Q *15/18*
U.S. Cl. 343—18 C **9 Claims**



1. A system for augmenting the visual and radar characteristics of an airborne target in a common sector comprising,

a. an elongated target body,

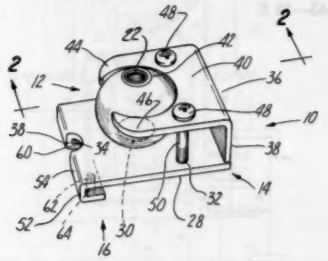
b. a visible light source mounted in line within the confines of said target body and adapted to emit a beam of light axially of said body in at least one direction,

c. a radar reflector mounted within the confines of said target body coaxially with and forwardly of said light source as viewed in the direction of travel of light from said light source so that said radar reflector is in the path of light propogating from said light source with said radar reflector being substantially transparent to light from said light source and reflective to radar wavelengths.

4,037,229
ANTENNA MOUNT

Thomas H. Dunk, 2470 Hunter Road, Brighton, Mich. 48116

Filed Feb. 9, 1976, Ser. No. 656,647
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—715 7 Claims

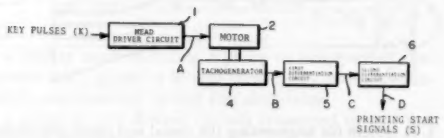


1. An antenna mount, comprising:
a. means for receiving an antenna,
b. means for securely retaining the antenna-receiving means, the retaining means comprising:
1. a base plate, the base plate having a seat defined therein for seatingly receiving a portion of the antenna-receiving means,
2. a top member spaced apart from the base plate and being substantially parallel thereto, the top member having a C-shaped cut-out section which engages the periphery of another portion of the antenna-receiving means to hold the antenna-receiving means in position, and
3. means for detachably interconnecting the base plate and the top member comprising a sidewall integral with the top member and abutting the base plate with adjustable fastening means spaced from said sidewall, and
wherein the antenna-receiving means is rotatable while retained by the retaining means, to permit proper orientation of an antenna.

4,037,230
TIMING CIRCUIT FOR INK JET SYSTEM PRINTER

Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 450,415, March 12, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,996
Claims priority, application Japan, Mar. 12, 1973, 48-28687
Int. Cl.[2] G01D 15/24
U.S. Cl. 346—75 3 Claims

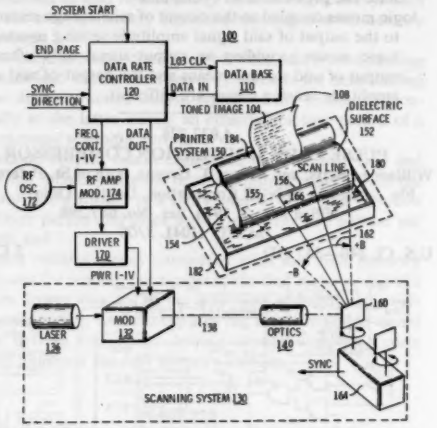


1. A print timing circuit for use in an ink jet system printer having a travelling printing head intermittently driven by a rotary motor in correlated response to intermittently applied input signals comprising: means for detecting the rotational velocity of the motor driving the said printing head of the ink jet system printer subsequent to the occurrence of each said intermittent input signal and means responsive to said detecting means for generating printing start signals for each of said intermittent input signals only when the rotational velocity of said motor and the resulting velocity of the printing head reaches a constant value.

4,037,231
VARIABLE CLOCK RATE RESONANT PRINTER WITH NONLINEAR CORRECTION

Douglas Wright Broyles, San Jose, and Troy Cecil Stark, Campbell, both of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,996
Int. Cl.[2] G06K 15/12
U.S. Cl. 346—108 17 Claims



1. A digital system for recording digital input data onto an energy-responsive recording medium by scanning the recording medium with a modulated energy beam, comprising:
a mechanical oscillator means having a sinusoidal displacement characteristic;
energy-directing means responsive to the sinusoidal displacement of the oscillator means for causing the energy beam to scan in a predetermined pattern across the recording medium at a sinusoidally varying rate;
controller for coordinating the data flow rate of the input data to approximately match the sinusoidal velocity of the energy beam across the recording medium by establishing a periodic series of constant data flow rates which are in effect for predetermined portions of the sinusoidal velocity function; and
modulator means responsive to the input data from the controller for modulating the energy beam prior to scanning by the energy-directing means.

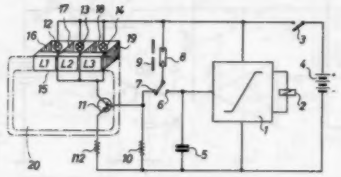
4,037,232
VISUAL EXPOSURE INDICATOR IN PHOTOGRAPHIC APPARATUS

Karl Wagner, Ottobrunn, and Bernhard von Fischern, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation of Ser. No. 59,998, July 31, 1970, abandoned. This application Jan. 18, 1973, Ser. No. 324,896
Int. Cl.[2] G03B 17/20
U.S. Cl. 354—23 R 5 Claims

1. In a photographic camera, in combination, light-sensing means for sensing the prevailing scene brightness and for generating a light-dependent voltage having at least a first voltage value, a second voltage value greater than said first value, and a third voltage value greater than said second value, corresponding respectively to first, second and third levels of scene brightness; an automatic exposure control unit operative for automatically selecting as a function of prevailing scene brightness any one of a plurality of exposure values including a first, a second and a third exposure value respectively corresponding to said first, second and third levels of scene brightness; and

at least a first, a second and a third light source means comprising respective light sources connected in parallel and each having a first condition and a second condition, one of said conditions being an illuminating condition and the other of said conditions being a non-illuminating condition, each connected to said light-sensing means for simultaneous receipt of said light-dependent voltage, and said first, second and third light source means being operative for assuming said first condition whenever and while said light-dependent voltage exceeds said first, second and third voltage values, respectively, whereby while said automatic exposure control unit selects said first exposure value said first light source means is in said first condition and said second and third light source means are in said second condition, and while said automatic exposure control unit selects said second exposure value said first and



second light source means are in said first condition and said third light source means is in said second condition, and while said automatic exposure control unit selects said third exposure value said first, second and third light source means are all in said first condition, said light-sensing means comprising impedance means connected to said light sources for varying the impedance in the current path of said light sources as a function of prevailing scene brightness, comprising a transistor having a collector-emitter path connected in series with the parallel combination of said light sources, and having a base constituting an input of said impedance means, said light-sensing means further comprising a light-sensitive resistor, a voltage source, and an additional resistor in series with said light-sensitive resistor and forming therewith a voltage divider connected across said voltage source and having a tap connected to said input of said impedance means.

4,037,233

EXPOSURE CONTROL DEVICE FOR A CAMERA

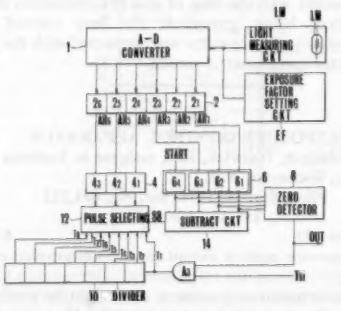
Nobuhiko Shinoda, Tokyo; Tadashi Ito; Fumio Ito, both of Yokohama; Yukio Mashimo, Tokyo, and Nobuaki Sakurada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1975, Ser. No. 606,572

Claims priority, application Japan, Aug. 27, 1974, 49-98660

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—23 D **9 Claims**



1. An electric shutter control device comprising:

a. photosensitive means for converting the intensity of light into a first electrical signal corresponding to the intensity;

b. an analog-to-digital converter for converting said first electrical signal to a digital signal of n bits, wherein n is an integer;

c. register means including an integral part register which stores an integral part of said digital signal of n bits and a fractional part register which stores a fractional part of the digital signal of n bits;

d. a frequency divider for forming a plurality of first control signals having frequencies differentiated from each other by a multiplier **1/2k**, wherein k is an integer;

e. a selecting circuit responsive to the content of said integral part register for selecting one of said control signals from said frequency divider;

f. a detecting circuit to said selecting circuit and said register means for detecting the content of the fractional part register and producing a second control signal when a predetermined relationship occurs between the number of pulses of the first control signal and the content of the fractional part register; and

g. shutter control means responsive to the second control signal from said detecting circuit from controlling the period of actuation of the shutter.

4,037,234

EXPOSURE CONTROL SYSTEM STABILIZED AGAINST TEMPERATURE VARIATION

Tokuichi Tunekawa, Yokohama; Soichi Nakamoto, Machida, and Tetsuya Taguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

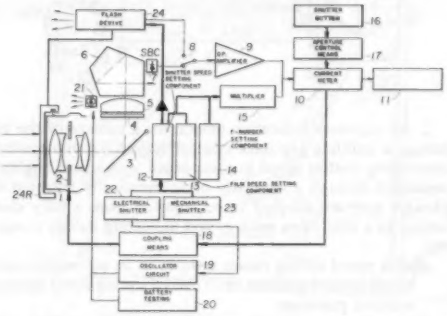
Continuation of Ser. No. 463,721, April 24, 1974, abandoned.

This application Dec. 30, 1975, Ser. No. 645,356

Claims priority, application Japan, Apr. 28, 1973, 48-48673; June 28, 1973, 48-73200

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—24 **6 Claims**



1. An exposure control apparatus comprising:

a photovoltaic cell positioned to sense the level of luminance of an object to be photographed;

a logarithmic converter circuit connected to said photovoltaic cell, comprising operational amplifier means for amplifying the output of said cell and logarithmic converter means for logarithmically compressing the amplified output of said photovoltaic cell, said logarithmic converter means having a negative temperature coefficient, said logarithmic converter circuit having an output level which takes on a value which varies as a constant ratio of the value corresponding to the output of the photovoltaic cell depending on temperature, and wherein the amount of variation of the converter output level dependent upon temperature takes on different values depending on the output of the photovoltaic cell at a prescribed temperature;

a source of electrical power;

voltage stabilizer means connected between said power source and said amplifier means for supplying a standard

voltage to said amplifier means, comprising temperature correction means for changing the standard voltage corresponding to ambient temperature, said change taking on a constant value at a certain temperature whereby the standard voltage is changed proportionally with the ambient temperature and the output of said logarithmic converter circuit varies in accordance with the change of the standard voltage;

electric resistance means coupled to the output terminal of said logarithmic converter circuit, said resistance means having a positive temperature coefficient, for correcting the output of said logarithmic converter; and

indicating means coupled to said electric resistance means to indicate the value corresponding to the output of said photovoltaic cell;

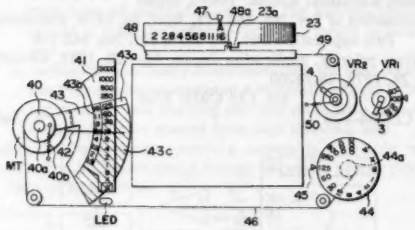
whereby the amount of variation of the logarithmic converter circuit dependent on temperature is substantially totally compensated by the simultaneous action of the variation of the standard voltage and the variation of the resistance value of the resistance means.

4,037,235

EXPOSURE INDICATING DEVICE FOR USE IN MULTIPLE EXPOSURE CONTROL CAMERAS

Hiroshi Ueda, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1975, Ser. No. 636,963
Claims priority, application Japan, Dec. 4, 1974, 49-138508
Int. Cl.[2] G03B *7/08, 17/20*
U.S. Cl. 354—38 **11 Claims**



1. An exposure indicating device for a camera of the type having a multiple exposure control system for automatically controlling shutter speed in accordance with scene brightness measured through a manually or automatically adjusted diaphragm aperture adapted to be adjusted from a fully closed setting to a fully open setting, said indicating device comprising:

shutter speed setting means settable to an automatic shutter speed control position or to one of a plurality of manually selected positions;

light responsive circuit means for generating a first output representative of scene brightness measured through the diaphragm aperture;

means for setting the film speed value;

adjusting means for adjusting said first output in accordance with said film speed value setting and generating a second output as a result thereof;

diaphragm value presetting means settable to one of a plurality of manually selected positions with the diaphragm aperture fully open;

second adjusting means responsive to the setting of said diaphragm presetting means for generating a third output including said second output;

an indicating means actuated in response to said third output,

a first scale member including a shutter speed scale, said indicating means indicating the shutter speed to be effected on said shutter speed scale with the preset diaphragm aperture;

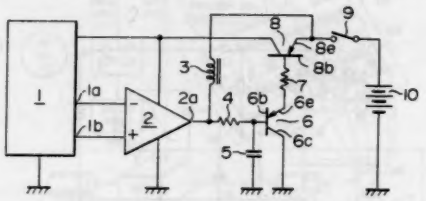
a second scale member movable relative to said first scale member and said indicating means in accordance with the position of said shutter speed setting means and including a first portion for indicating the set shutter speed on said shutter speed scale, said second scale member further including a diaphragm scale, said indicating means also indicating the diaphragm aperture to be automatically determined with said set shutter speed.

4,037,236

SWITCHING CIRCUIT FOR ELECTRIC SHUTTER

Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Nov. 10, 1975, Ser. No. 630,432
Claims priority, application Japan, Nov. 8, 1974, 49-128766
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—51 **1 Claim**



1. In a photographic camera including an automatic shutter speed control means comprising a power source, a power switch connected therewith which is closed upon depression of a shutter release button and held in its closed position until the shutter release is completed, a shutter speed control circuit which measures the scene brightness and provides an output voltage which rises up at a rate corresponding to the scene brightness measured thereby, and an electromagnet for holding a trailing shutter blind connected between said power switch and the output of said shutter speed control circuit, said electromagnet being energized while the output voltage of said shutter speed control circuit is below a predetermined level and deenergized when the output reaches the predetermined level, whereby the shutter speed is controlled by the rate at which the output voltage, rises, a switching circuit connected between said power switch and said shutter speed control circuit for electrically connecting the power switch to the circuit when turned on, said switching circuit being turned on when said power switch is closed and when the output of said shutter speed control means is below said predetermined level and turned off when said power switch is opened or when power switch is closed and the output of said shutter speed control circuit is not lower than said predetermined level, whereby the switching circuit is turned off upon deenergization of said electromagnet, said switching circuit comprising a first transistor, the emitter thereof being connected with the power switch, the collector thereof being connected with said shutter speed control circuit for supplying power to the latter when turned on, and a second transistor, the emitter thereof being connected with the base of said first transistor, the collector thereof being grounded, the base thereof being grounded by way of a capacitor and connected with the output of said shutter speed control circuit.

4,037,237

EXPOSURE CONTROL APPARATUS

Robert J. Maigret, Warwick, R.I., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,272
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—51 **4 Claims**

4. An exposure control circuit for a photographic camera, comprising:

photometric means responsive to scene light for producing a photocurrent proportional to scene brightness;

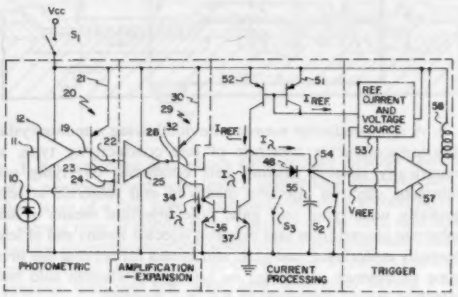
means for expanding said photocurrent including a multicol-

lector PNP transistor having a base to which said photocurrent is supplied and first and second collectors for supplying two equal currents which are proportional to said photocurrent;

means for generating a reference current proportional to a predetermined level of scene brightness;

a diode having an anode terminal and a cathode terminal, said first collector being connected to said cathode terminal;

a first current mirror having an input connected to said reference current generating means an output connected to said anode terminal of said diode, said first current mirror being responsive to said reference current for



supplying a current equal to said reference current to said anode terminal of said diode;

a second current mirror having an input connected to said second collector and an output connected to said anode of said diode, said second current mirror being responsive to said current proportional to said photocurrent for attempting to draw a current equal to said current proportional to said photocurrent from said anode of said diode;

means connected to said cathode terminal of said diode for integrating the current thereat; and

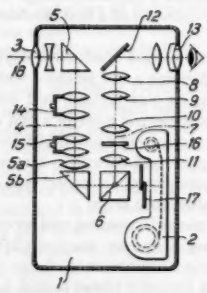
trigger means connected to said integrating means and responsive to said integrated current for controlling an exposure.

4,037,238

STILL POCKET CAMERA

Ludwig Leitz, Wetzlar, Germany, and Walter Mandler, Midland, Canada, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Sept. 5, 1975, Ser. No. 610,689
Claims priority, application Germany, Sept. 21, 1974, 2445289
Int. Cl.[2] G03B *19/12*; G02B *15/00*
U.S. Cl. 354—152 **18 Claims**



1. In a photographic mirror reflex still pocket camera having a picture taking objective, an optical axis thereof defining the picture taking direction, means in said camera for inserting a film cassette, a film plane in said cassette, and shutter means disposed in front of said film plane, the improvement comprising:

a. first means for deflecting said optical axis parallel to said film plane and transverse to said picture taking direction defining a first deflected optical axis:

b. a zoom means located along said first deflected optical axis;

c. second means for deflecting said first deflected optical axis defining a second deflected optical axis, said second deflected optical axis being directed perpendicularly to the center of said film plane; and

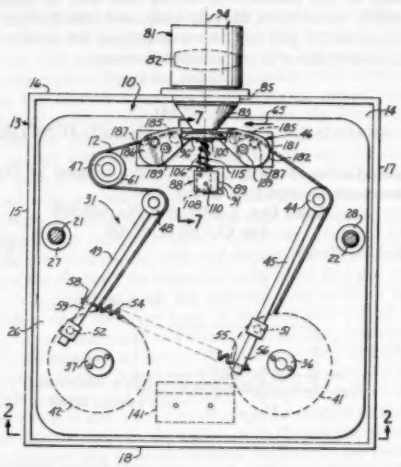
d. beam splitting means arranged in the path of said second deflected optical axis for deflecting a portion of the light rays defining said second deflected optical axis, said portion defining a view beam path.

4,037,239

MICROFILM CAMERA AND PHOTOGRAPHIC FILM HANDLING APPARATUS WITH AN ACTUABLE FILM CLAMPING DEVICE

John Jamieson, Los Gatos; Henry F. Price, Laguna Niguel, and William O. Butts, Irvine, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 26, 1974, Ser. No. 536,701
Int. Cl.[2] G03B *27/44, 17/00*
U.S. Cl. 354—203 **33 Claims**



1. In a camera for photographing information on microfilm, the improvement comprising in combination:

means defining an image aperture;

means including a lens system for projecting an image of said information along an optical path through said image aperture;

means for selectively clamping microfilm against said image aperture defining means;

means connected to said image aperture defining means and said clamping means for mounting and restraining said image aperture defining means and said clamping means against lateral movement relative to said optical path;

a carriage;

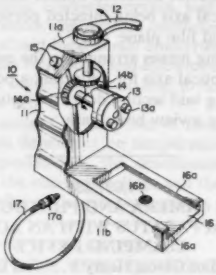
means for moving said carriage relative to said image aperture defining means, projecting means and clamping means; and

means on said carriage for advancing microfilm between said image aperture defining means and clamping means.

4,037,240
GRIP FOR A CAMERA

Yoshikazu Ando, Musashino, and Junichi Yokozato, Kawagoe, both of Japan, assignors to Zenza Bronica Industries, Inc., Tokyo, Japan

Filed July 23, 1976, Ser. No. 708,082
Int. Cl.[2] G03B 1/00, 29/00
U.S. Cl. 354—212 9 Claims

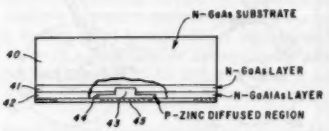


1. A grip for a camera removably attached to a camera which has a film wind-up knob on the right side thereof comprising a grip body removably attached to the camera body on the right side thereof, a rotatable member engageable with a film wind-up knob of the camera for transmitting the rotation thereof in one direction to the knob, a film wind-up lever rotatably mounted on the grip body, and transmission means provided in the grip body for transmitting the rotation of the film wind-up lever to the rotatable member.

4,037,241
SHAPED EMITTERS WITH BURIED-JUNCTION STRUCTURE

Eugene Gustav Dierschke, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 2, 1975, Ser. No. 618,978
Int. Cl.[2] H01L 33/00
U.S. Cl. 357—17 6 Claims



1. A light emitting semiconductor device comprising a monocrystalline III-V compound substrate having a first surface layer of n-type III-V material thereon, said first layer having a first bandgap energy;

a second layer of n-type III-V material covering said first layer, said second layer having a higher bandgap energy than said first layer;

a p-type region within said first and second layers extending from the surface of said second layer completely through the thickness of said second layer and only partially through the thickness of said first layer, thereby forming a light emitting pn junction;

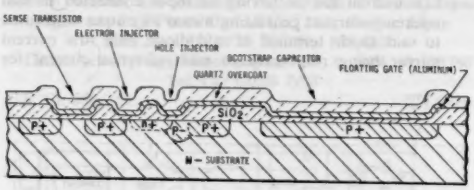
said p-type region being wholly surrounded at the surface by said second n-type surface layer and having a stepped geometry such that the area of said pn junction within said first n-type layer is substantially smaller than the area of said pn junction within said second n-type layer; and

means forming an ohmic contact with said p-type region, said means having an area of contact with said p-type region, said area of contact being substantially larger than the area of said pn junction confined within said first n-type surface layer.

4,037,242
DUAL INJECTOR, FLOATING GATE MOS ELECTRICALLY ALTERABLE, NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

William Milton Gosney, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 644,982
Int. Cl.[2] H01L 29/78, 27/02; G11B 13/00; G11C 11/44
U.S. Cl. 357—23 6 Claims

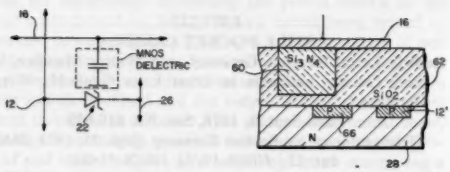


1. A semiconductor memory device having a monocrystalline semiconductor substrate of one conductivity type, an electrically isolated floating gate conductor overlying said substrate, electron injection means in said substrate at least partially underlying said gate, hole injection means in said substrate spaced from said electron injector means and at least partially underlying said gate, and means for sensing the presence or absence of charge on said gate, wherein said hole injection means comprises an $n+/p-$ junction.

4,037,243
SEMI CONDUCTOR MEMORY CELL UTILIZING SENSING OF VARIATIONS IN PN JUNCTION REVERSE CURRENT CONTROLLED BY STORED DATA

Charles R. Hoffman, Tempe, and Michael W. Powell, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 484,487, July 1, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,394
Int. Cl.[2] H01L 29/78, 27/02, 29/34
U.S. Cl. 357—23 7 Claims



1. A junction memory cell comprising:

a body of semiconductor of a first conductivity type having a surface;

a first region of a second conductivity type in said body at said surface forming a PN junction with said body;

dielectric means on said surface, said dielectric means including a first dielectric layer of a first dielectric material on said surface covering a junction between said body and said first region, said dielectric means also including a second dielectric layer of a second type dielectric material on said first dielectric layer;

gate electrode means located on said second dielectric layer for controlling a reverse junction current generated by said PN junction responsive to charge representative of a logical 1 or a logical 0 stored in said dielectric means;

data input means coupled to said gate electrode means for effecting writing said logical 1 or said logical 0 into said dielectric means; and

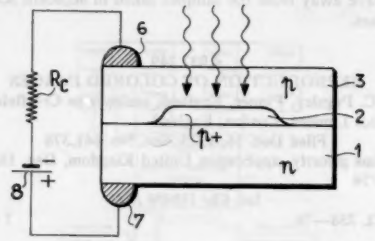
sensing output means coupled to said second region for effecting sensing said reverse junction current during reading of said junction memory cell.

4,037,244

AVALANCHE PHOTODIODE

Baudouin de Cremoux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 7, 1976, Ser. No. 684,382
Claims priority, application France, May 16, 1975, 75.15437
Int. Cl.[2] H01L *27/14, 29/161*
U.S. Cl. 357—30 8 Claims



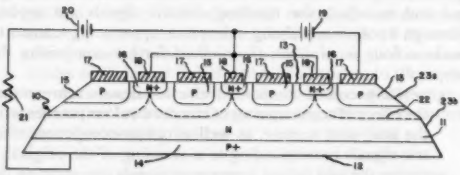
1. An avalanche photodiode for detecting incident radiation of a predetermined wavelength comprising superimposed, a first layer of a first type of conductivity and a second layer of a second type of conductivity opposite to the first, said layers having respective superimposed central portions, and inserted in one of said central portions a third layer forming a rectifying junction with said first layer, said third layer having a high impurity concentration, so that the electrical avalanche phenomenon is localized preferentially in said third layer for reverse biasing predetermined voltage values applied to said diode.

4,037,245

ELECTRIC FIELD CONTROLLED DIODE WITH A CURRENT CONTROLLING SURFACE GRID

Armand P. Ferro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,070
Int. Cl.[2] H01L *29/00, 29/74, 29/80, 29/747*
U.S. Cl. 357—38 13 Claims



1. A three-electrode semiconductor current controlling device comprising:

a semiconductor substrate of N-type conductivity, said substrate having opposed major surfaces;

an anode region of P-type conductivity formed in one major surface;

a plurality of gate regions of P-type conductivity formed in the other major surface, said gate regions comprising an interconnecting grid structure of P-type conductivity;

a plurality of interconnecting cathode regions of N-type conductivity of higher impurity concentration than said substrate, each of said cathold regions formed in said other major surface and in the interstices defined by said interconnecting grid structure;

anode, gate and cathode electrodes respectively overlying said anode, gate and cathode regions and making low ohmic contact therewith; and

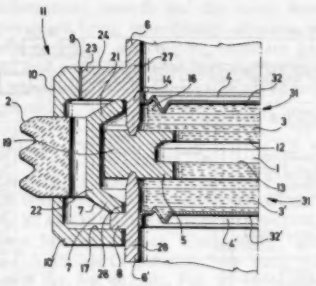
means for controlling the flow of electrical current between said anode and cathode electrodes, said means including the formation of depletion regions in said substrate around each gate region, the intersection of adjacent depletion regions causing the termination of current flow between said anode and cathode electrodes.

4,037,246

HIGH-POWER SEMICONDUCTIVE DEVICES

Michal Pellant; Oldrich Pokorny; Pavel Reichel; Jaroslav Zuna; Pavel Kafunek, and Jindrich Kratina, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed July 16, 1975, Ser. No. 596,437
Claims priority, application Czechoslovakia, Sept. 5, 1974, 6116/74
Int. Cl.[2] H01L *23/48, 23/02, 25/04*
U.S. Cl. 357—82 4 Claims



1. In a high-power semiconductive device including an active semiconductive element symmetrically disposed about a first axis, the elements containing at least one P-N junction and including at least first and second axially spaced, opposed terminal regions associated with such junction, mutually insulated means for supplying current to and receiving current from the first and second terminal regions, and means including a conductive liquid for providing conductive contact between the current supplying and receiving means and the respective terminal regions of the element, the improvement wherein the device further comprises an annular insulation ring coaxial with and surrounding the element, the radially inner surface of the insulating ring being disposed in intimate contact with the outer periphery of the element intermediate the axially opposite surfaces of the ring; wherein the current supplying and receiving means comprises first and second conductive tubes coaxial with and disposed on axially opposite sides of the element, the boundary walls of the first and second tubes being aligned with the opposed axial surfaces of the insulating ring, the inner ends of the first and second tubes being of reduced width and disposed in intimate contact with the axially opposite surfaces of the insulating ring; and wherein the device further comprises a pair of thin conductive plates extending across and substantially closing the interior of the respective first and second tubes in spaced relation to the ends of the tubes to individually define, with the associated ends of the tubes and the opposed terminal regions of the elements, first and second mutually insulated closed chambers, the conductive liquid filling each of the closed chambers.

4,037,247

STILL COLOR TELEVISION SIGNAL RECORDING AND REPRODUCING APPARATUS

Yoshinori Tanaka, Yokohama, and Hisaaki Narahara, Musashino, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,408
Claims priority, application Japan, June 23, 1975, 50-77354
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—4 6 Claims

1. A still color television signal recording and reproducing apparatus comprising:

a. a color television signal source;

b. a storage tube having horizontal and vertical deflection means;

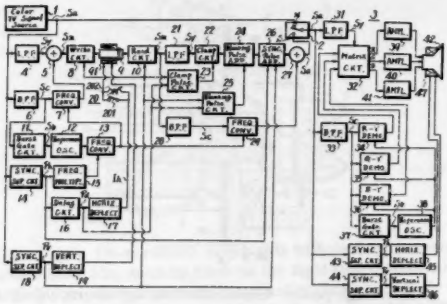
c. WRITE circuit means connected to said signal source for applying a field of a color television signal to said storage tube when operated;

d. READ circuit means connected to said storage tube for reading out a color video signal from the latter when operated;

e. a color picture reproducing means connected to said READ circuit means for receiving said color video signal therefrom;

f. a horizontal deflection circuit connected to said signal source for supplying a horizontal deflection signal to the horizontal deflection means of said storage tube; and

g. a vertical deflection circuit connected to said signal source for supplying a vertical deflection signal to the



vertical deflection means of said storage tube; wherein a compensation circuit is connected to said horizontal deflection circuit for making the horizontal scanning size of the READ period substantially equal to that of the WRITE period for said storage tube; and said color picture reproducing means includes a reference oscillator which receives a color burst component from the color video signal derived from said READ circuit means and is phase-locked to said color burst component in order to demodulate a plurality of color component signals from said color video signal.

4,037,248

SYSTEM FOR CODING AND/OR DECODING COLOR TELEVISION SIGNAL INCLUDING LUMINANCE AND CHROMINANCE INFORMATION

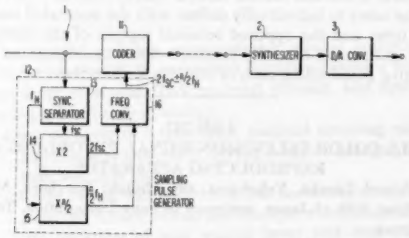
Yukihiko Iijima, and Tatsuo Ishiguro, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,679

Claims priority, application Japan, Feb. 28, 1975, 50-25355

Int. Cl.[2] H04N *9/02*

U.S. Cl. 358—13 **16 Claims**



1. A system for coding a composite color television signal including a luminance signal and carrier chrominance signals, said carrier chrominance signals being formed by modulating a subcarrier wave by chrominance information, the subcarrier frequency of said subcarrier wave being $m/2$ (m stands for an odd number) of the horizontal scanning frequency of said television signal, the phases of said subcarrier waves between two adjacent scanning periods being 180° away from each other, said coding system comprising:

means for producing sampling pulses of a repetition frequency lower than the Nyquist frequency of said television signal;

means for sampling and coding said television signal in response to said sampling pulses; and

means for controlling said sampling pulses in such manner that the samples of said television signal are taken at points about 180° of said subcarrier wave away from each other in each scanning line and also about 90° of said subcarrier wave away from the samples taken in adjacent scanning lines.

4,037,249

REPRODUCTION OF COLORED IMAGES

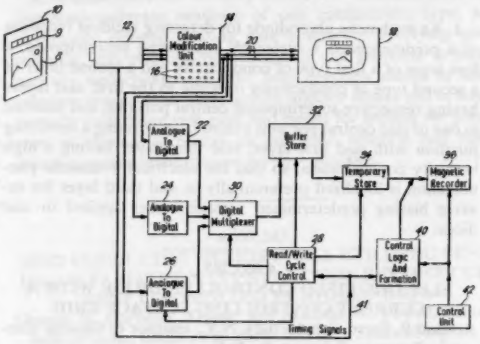
Peter C. Pugsley, Pinner, England, assignor to Crosfield Electronics Limited, London, England

Filed Dec. 16, 1975, Ser. No. 641,378

Claims priority, application United Kingdom, Dec. 18, 1974, 54670/74

Int. Cl.[2] H04N *1/46*

U.S. Cl. 358—76 **7 Claims**



1. A method of reproducing coloured originals, in which an original is scanned by means of an analysing scanner to obtain electric signals the values of which at any instant correspond to colour-component densities of a scanned element of the original and in which the resulting electric signals are applied through a colour-modifying means to a reproducing scanner to make colour separations, the method further comprising the steps of:

generating colour-component electric signals representing the effect of scanning a set of standard colour patches with the analysing scanner, as well as colour-component electric signals corresponding to a scanning of the original;

applying the said colour component signals representing the colour patches and original to a display system having a known colour calibration through a display adjustment unit, by means of which an operator can adjust the signals as required and thereby adjust the coloured reproduction on the display system;

sampling the adjusted display signals fed to the display system to obtain signal samples representing the displayed standard colour patches;

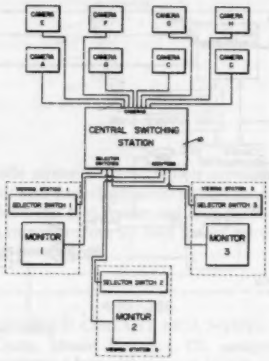
adjusting the said colour-modifying means in accordance with the values of the colour-patch display sample signals in such a manner that the use of signals representing the effect of scanning the said standard colour patches, after their modification by the colour-modifying means, to control the reproducing scanner would result in colour separations leading to a reproduction of the standard colour patches which simulated the appearance of these patches in the adjusted colour reproduction on the display system;

and thereafter applying signals, resulting from scanning the original, through the adjusted colour-modifying means to the reproducing scanner to make colour separations from the original.

4,037,250
VIDEO SWITCHER

Everett G. McGahan, and Charles L. Melanko, both of 2185 N. West St., Lima, Ohio 45805

Filed Aug. 22, 1974, Ser. No. 499,623
Int. Cl.[2] H04H 5/22
U.S. Cl. 358—108 12 Claims

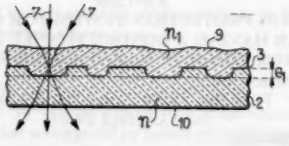


1. A video surveillance apparatus comprising:
a. a plurality of video cameras;
b. a plurality of video viewing stations, each station equipped with a video monitor and a remote selector switch comprising means for controlling the exhibition of video signals from any selected camera; and
c. a central Master Video Switcher in direct electronic communication with each of said cameras, said monitors, and said remote selector switches, said central Video Switcher including a plurality of electrical switching means each associated with a different one of said viewing stations, each of said electrical switching means being remotely controlled by the selector switch of an associated viewing station for connecting in selected random access any selected one of said video cameras to the monitor of its associated viewing station independently of any connection between said camera or any other camera with any other viewing station.

4,037,251
DATA CARRIER OPTICALLY READ OUT BY TRANSMISSION, AND METHOD OF MANUFACTURING SAID DATA CARRIER

Claude Bricot; Bernard Carre; Jean Claude Dubois; Francois Le Carvennec; Jean Claude Lehureau, and Claude Puech, all of Paris Cedex, France, assignors to Thomson-Brandt, Paris, France

Filed May 13, 1975, Ser. No. 577,106
Claims priority, application France, May 15, 1974, 74.16875
Int. Cl.[2] H04N 5/76
U.S. Cl. 358—128 15 Claims

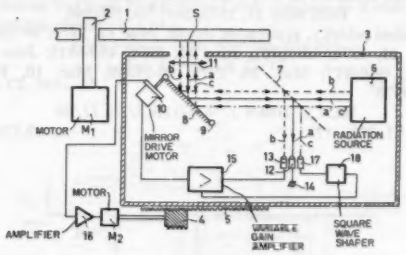


1. A method of manufacturing a data carrier optically readable by transmission using a predetermined optical radiation, which comprises:
forming on at least one of the faces of a substrate transparent vis-a-vis said optical radiation a relief impression made of a succession of diffractive elements in the form of alternate peaks and troughs arranged along a track of substantially constant width; said succession of diffractive elements being of non uniform length and spacing along the axis of said track, and covering said relief impression with at least one protective layer transparent vis-a-vis said optical radiation; the upper face of said protective layer being substantially smooth and the lower face of said protective layer being immediately adjacent said relief impression to create a refractive boundary having the profile of said relief impression and thereby causing diffractive spreading of said optical radiation by said diffractive elements.

4,037,252
APPARATUS FOR READING A DISC-SHAPED RECORD CARRIER WITH PLURAL SCANNING SPOTS FOR STABLE RADIAL TRACKING

Peter Johannes Michiel Janssen, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 442,501, Feb. 14, 1974, abandoned.
This application Oct. 17, 1975, Ser. No. 623,550
Claims priority, application Netherlands, Nov. 10, 1973, 7315419
Int. Cl.[2] H04N 5/76
U.S. Cl. 358—128 13 Claims



1. An apparatus for reading a discshaped record carrier on which signals are stored in substantially circular adjacent tracks, which apparatus comprises a radiation source which emits a radiation beam, a read detector, directing means for projecting said radiation onto the record carrier as a read spot of radiation at a scanning point on the record carrier, for transferring the information contained in the scanninng point of the record carrier to the read detector and for radially positioning the read beam on the record carrier, said directing means being capable of scanning said radiation beam across several adjacent tracks of said record carrier, a control system in said directing system for controlling the radial position of the information contained in the scanning point of the desired track on the read detector, which control system includes a drive means for the directing system and a first measuring system for measuring the radial position of the scanning point and for supplying a corresponding first control signal to the drive means, which first measuring system further comprises means for projecting a first pattern of radiation spots on the record carrier, a first measuring detector means for supplying a first control signal, which during a radial movement of the scanning point over a number of track distances includes a periodic a.c. component whose period equals the distance between adjacent tracks divided by the speed of the radial movement of the scanning point, the control system being stable for one half period of the said a.c. component and being unstable for the other half period of the control system, a second measuring system, said second measuring system comprising a second measuring detector, means for projecting a second pattern of radiation spots

onto the record carrier and for imaging the second pattern onto said second measuring detector, said second pattern of radiation spots being radially shifted with respect to said first pattern of radiation spots, means connected to said second measuring detector for supplying a second control signal, which upon radial movement of the scanning point over a number of track distances contains a periodic a.c. component whose period equals the track distance divided by the speed of the radial movement of the scanning point, but which a.c. component as a result of said radially shifted position of the second pattern of radiation spots relative to that of the first pattern of radiation spots exhibits a phase shift of substantially a quarter period relative to the a.c. component of the first control signal, processing means for deriving a third control signal from said second control signal, said third control signal indicating said unstable half periods of said control system, a control unit, said control system having a variable transfer function which is controlled by said control unit which receives said third control signal which is derived from the second control signal, said control unit upon a movement of the scanning point over a number of track distances alters the transfer function of said control system in response to said instability indications of said third control signal, whereby said control system is stabilized.

4,037,253

PRESSURE SENSITIVE SIGNAL REPRODUCING SYSTEM FOR A VIDEODISC

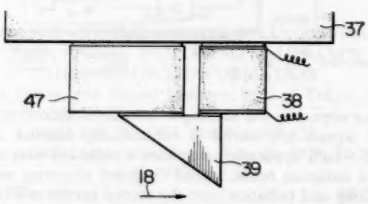
Tadashi Nagaoka, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 27, 1975, Ser. No. 580,946

Claims priority, application Japan, June 11, 1974, 49-66900; June 11, 1974, 49-66901; June 11, 1974, 49-66915; June 11, 1974, 49-66917; Mar. 10, 1975, 50-29369; Mar. 10, 1975, 50-29370

Int. Cl.[2] H04N *5/76;* **G11B** *3/10, 11/06*

U.S. Cl. 358—128 **9 Claims**



1. A signal reproducing device for use with a uniformly rigid record medium formed with a guide groove having an uneven pattern formed on at least the bottom thereof with projections of the signal segment being located at intervals corresponding to a modulated recorded signal, said device comprising:

an elastic support member,

a scanning member including a first surface substantially parallel to said record medium, a trailing surface inclined at a first angle with respect to said record medium and a leading surface inclined at a second angle with respect to said record medium, the line forming the intersection of said trailing surface and said leading surface forming a trailing edge extending transverse to said guide groove, and

a mechanical-electrical transducing element interposed between said elastic support member and said scanning member, said trailing edge pressing said record medium along said guide groove without substantial deformation of said record medium, changes in the inclination angle of said scanning member with respect to said record medium caused when said trailing edge engages with or disengages from said projections being detected by said mechanical electrical transducing element to produce a reproduced electrical signal.

4,037,254

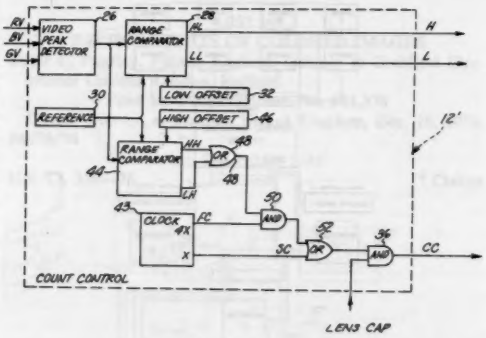
AUTOMATIC DIGITAL IRIS CORRECTION

John F. Monahan, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 10, 1975, Ser. No. 639,470

Int. Cl.[2] H04N *5/193*

U.S. Cl. 358—228 **6 Claims**



1. Automatic digital aperture control apparatus for a television camera having at least one video output signal and comprising;

peak detection means responsive to said at least one video output signal for providing a peak signal having a value which varies with the intensity of said video output signal;

count control means for producing a first command signal when said peak signal rises above a first upper limit, and a second command signal when said peak signal falls below a first lower limit;

a source of first clock pulses having a first pulse repetition rate;

bidirectional digital counting means for counting clock pulses in a first or second direction in response to said first and second command signals, said counting means providing a digital output signal having a value in dependence upon the pulse count difference between the number of clock pulses counted in said first direction and those counted in said second direction;

digital to analog converting means for converting said digital output signal to a corresponding analog signal having a value in accordance with said pulse count difference;

aperture control means for controlling the amount of light admitted to said television camera in response to said analog signal;

a source of second clock pulse having a second pulse repetition rate greater than said first pulse repetition rate;

gating means responsive to a third command signal for gating said second clock pulses to said counting means and for otherwise gating said first clock pulses to said counting means; and,

means for providing said third command signal when said peak signal rises above a second upper limit greater than said first upper limit or falls below a second lower limit smaller than said first lower limit.

4,037,255

IMPLOSION PROTECTION SYSTEM FOR COLOR CRT BULB HAVING A BONDED FUNNEL FRAME

Monty B. Hill, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

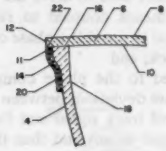
Filed Dec. 11, 1975, Ser. No. 639,741

Int. Cl.[2] H01J *29/87*

U.S. Cl. 358—246 **8 Claims**

1. A color television picture tube having a glass bulb with an approximately rectangular, flangeless, curved faceplate having

a convex front surface through which television pictures are viewed, a concave rear surface with a phosphor screen deposited on a portion thereof, the glass bulb also having a funnel having a convex seal land which mates with the concave inner surface of the faceplate to define a contoured sealing interface, said tube including a low cost funnelbond implosion protection system comprising:



a high tensile strength frame which surrounds and hugs a portion of said funnel adjacent to said faceplate; and

a cement between said frame and said funnel, said cement and said frame binding up said funnel portion to provide implosion protection.

4,037,256

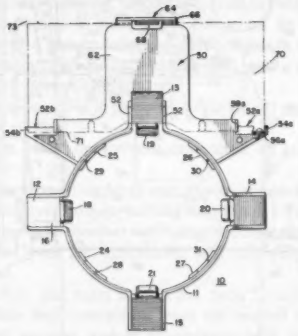
CONVERGENCE CIRCUIT MOUNTING DEVICE

Thomas A. Costa, Mount Prospect, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed May 5, 1976, Ser. No. 683,329

Int. Cl.[2] H04N *5/655*

U.S. Cl. 358—248 **9 Claims**



1. In a television receiver, a device for releasably positioning a control panel with respect to a cathode ray tube (CRT) of the receiver, said control panel having a circuit of said TV receiver disposed thereon, said positioning device comprising:

a. an annular member adapted to be disposed about said CRT; and

b. means associated with said annular member for releasably securing said control panel to said device and in a predetermined relationship with respect to the CRT.

4,037,257

DATA CLOCK SEPARATOR WITH MISSING CLOCK DETECT

Srinivasan V. Chari, Foster City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1976, Ser. No. 654,489

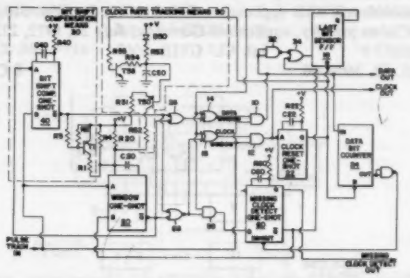
Int. Cl.[2] G11B *5/09*

U.S. Cl. 360—51 **20 Claims**

1. A method for varying the on-time of an electronic window one-shot that is triggered by pulses on an input pulse train to thereby generate timed output pulses, wherein the normal output pulse width of said one-shot is set by a predetermined value of resistance and capacitance in an RC network connected to said one-shot, said method comprising the steps of:

a. detecting a condition for which a different pulse width is desired;

b. triggering a second one-shot, in response to the detected condition, to generate a second timed pulse;



c. activating an electronic switch in response to the second pulse; and

d. using said switch to charge the time constant value of the timing network of said window one-shot to thereby change the output pulse width of said window one-shot.

4,037,258

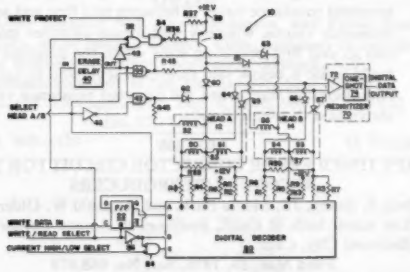
READ/WRITE APPARATUS FOR MAGNETIC RECORDERS

Srinivasan V. Chari, Foster City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1976, Ser. No. 654,491

Int. Cl.[2] G11B *15/12*

U.S. Cl. 360—63 **12 Claims**



1. In a read/write apparatus for magnetic recorders including a magnetic recording and reproducing head having at least one winding for converting electric signals into magnetic flux variations that may be recorded on a magnetic recording medium movable relative to said head and for converting said magnetic flux variations so recorded back into electric signals, the improvement comprising:

control means for generating a signal to be recorded, said control means including a digital decoder capable of numeric base transformations and having a plurality of inputs for receiving function control and data input signals and plurality of outputs normally at a first voltage state, wherein a predetermined number of said outputs will assume a second voltage state in response to the particular function control and data input signals applied at its inputs; and

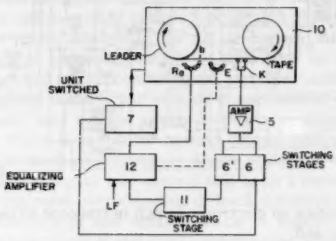
write means for generating said electric signals, said write means including a voltage source coupled to said head and capable of being applied across said winding when at least a predetermined one of said outputs is at its second voltage state, whereby current of a predetermined magnitude is made to flow through said winding.

4,037,259

METHOD AND EQUIPMENT FOR SWITCHING THE OPERATING CONDITIONS OF A TAPE-RECORDER

Fritz Hammon; Georg Schnell, and Karl-Juergen Reimer, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 382,344, July 25, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,232
Claims priority, application Germany, July 26, 1972, 2236593
Int. Cl.[2] G11B *5/47*
U.S. Cl. 360—66 **8 Claims**



1. Apparatus for controlling the operating of a magnetic tape transport device, the device having a magnetic signal transducer and an electronic equalizing circuit capable of being switched to a first operating state for providing a first bias to said transducer for use with tapes having a first magnetic coating resistance value and a first coercivity, and to a second operating state for providing a second bias to said transducer for use with tapes having a second magnetic coating resistance value and a second coercivity, comprising:

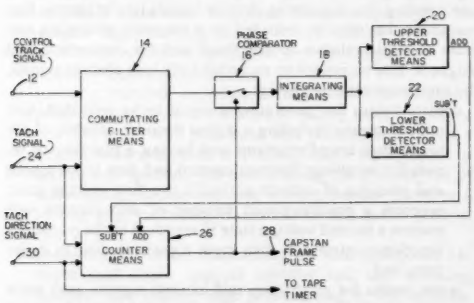
means for detecting the resistance value between two adjacent points on the tape and for switching said circuit, said means having a threshold level corresponding to a predetermined resistance value in between said first and second resistance values, whereby said means switches said circuit to said first operating state when the detected resistance value is below said threshold level and to said second operating state when the detected resistance value is above said threshold level.

4,037,260

TAPE TIMER ERROR CORRECTOR CIRCUIT FOR TAPE RECORDER/REPRODUCERS

Edwin S. Busby, Jr., Menlo Park, and Reginald W. Oldershaw, Los Altos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,678
Int. Cl.[2] G11B *15/52, 15/54*
U.S. Cl. 360—73 **10 Claims**



1. An error corrector circuit for generating precise frame pulses for a tape timer circuit in a tape recorder/reproducer having a tape, a multiple frequency tape control track recorded thereon indicative of the precise transport of tape past head means, and a capstan tach for deriving a tach signal indicative of the rotation of a capstan against the tape, comprising the combination of;

first means coupled to the control track and responsive to the capstan tach for generating a filtered control track signal of selected frequency at any speed of tape motion;

second means disposed to receive the capstan tach signal for generating a capstan tach clock of the same frequency as that of the filtered control track signal and definitive of the frame rate pulses used to drive the tape timer circuit;

phase comparison means coupled to receive the filtered control track signal to provide a phase comparison thereof with the tach clock; and

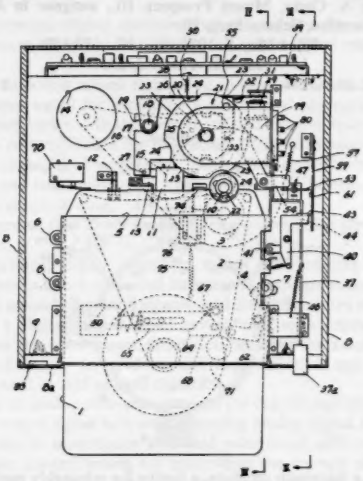
third means coupled to the phase comparison means for detecting any phase deviations between the tach clock and the filtered control track signal and for correspondingly updating the second means and thus the frame pulses in response to the phase comparison.

4,037,261

TAPE RECORDER WITH HEAD POSITIONING MECHANISM

Masami Shin, Mubanchi Kurojinishi Nakagawa-cho, Nakagun, Tokushima, and Kanji Tamaki, 32 Nakagawahara Yokomi-cho, Anan, Tokushima, both of Japan

Filed Apr. 28, 1975, Ser. No. 571,951
Claims priority, application Japan, May 3, 1974, 49-62120
Int. Cl.[2] G11B *5/54, 21/08, 23/18*
U.S. Cl. 360—78 **2 Claims**



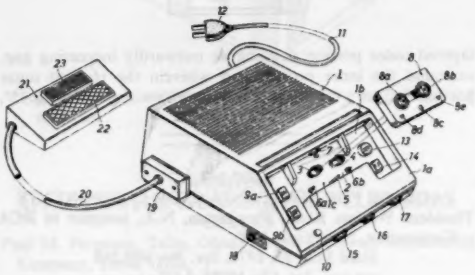
1. A tape recorder comprising a case for accommodating a magnetic tape cartridge in a playable condition, the magnetic tape cartridge having a plurality of channels, a flexible roll linked to a capstan shaft for forwarding the magnetic tape at a uniform speed, and a rotary body having a first cam, a second cam and a channel switch cam, said first cam adjoining the flexible roll to transfer torque of the capstan, said second cam locating the first cam and adjoining the first cam to the flexible roll, the channel switch cam switching adjoining position of a magnetic head to the magnetic tape wherein the torque of the capstan shaft is transferred to the rotary body through the flexible roll thereby achieving channel switch operations of the magnetic head, said first cam being shaped in a circle and being provided with a plurality of hollows of the same numbers as the channels in the magnetic tape, said second cam being provided with a plurality of notches of the same number as the channels in the magnetic tape, said notches being cooperated with a locating plate for stopping and supporting the rotary body at desired channel position, whereby the channel switch cam may be maintained at position corresponding to selected channel position of the magnetic head by stopping the hollow of the first cam at opposite position to the flexible roll.

4,037,262

SOLENOID OPERATED TRANSCRIBER MECHANISM

Minoru Kabayashi, Hachioji, and Kazumi Miyazi, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan and Lanier Business Products Company, Atlanta, Ga.

Filed July 12, 1976, Ser. No. 704,445
Claims priority, application Japan, July 16, 1975, 50-99217[U]; Sept. 30, 1975, 50-133956[U]
Int. Cl.[2] G11B 15/10
U.S. Cl. 360—96 4 Claims



1. In a transcriber having a control circuit provided with a main switch adopted to turn either on or off an electrical connection with a power source, a pinch roller, a capstan, a reproducing magnetic head, a winding shaft, and a rewinding shaft, the improvement comprising:

a sliding plate movable in response to the on-off operation of said main switch,

a connection lever operatively connected to said sliding plate,

a pinch roller supporting lever operatively connected to said connection lever and supporting said pinch roller,

a head supporting member operatively connected to said connection lever and supporting said reproducing magnetic head,

whereby when said main switch has been turned on, said sliding plate and connection lever are moved each by a prescribed amount, and in accordance with this movement said pinch roller supporting lever and head supporting member are moved to permit said pinch roller and magnetic head to be brought to a condition ready for operation,

a playback solenoid,

playback switching means for energizing and deenergizing said playback solenoid,

a pushing member moved by energization of said playback solenoid to move said connection lever, thereby to cause said pinch roller and magnetic head to be brought to an operative position,

a selectively rotating mechanism for rotating said winding shaft by energizing of said playback solenoid,

a backspace solenoid operatively associated with said playback solenoid,

back-space switching means for energizing and deenergizing said backspace solenoid,

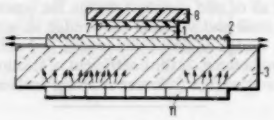
whereby when said backspace solenoid is energized, said playback solenoid is deenergized to permit said pinch roller and magnetic head to be brought to a condition ready for operation through said connection lever and said selectively rotating mechanism is caused to rotate said rewinding shaft.

4,037,263

ARRANGEMENT FOR THE DIRECT CONVERSION OF ITEMS OF DATA STORED IN MAGNETIC FORM INTO OPTICAL SIGNALS

Peter Moeckel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 21, 1975, Ser. No. 597,682
Claims priority, application Germany, July 23, 1974, 2435415
Int. Cl.[2] G02B 5/14
U.S. Cl. 360—114 6 Claims



1. An arrangement for directly converting magnetically stored data of a moving record adjacent thereto into optical signals, comprising:

a wave guide laser having an index of refraction n_2;

a transparent substrate having an index of refraction n_3 and carrying said wave guide laser thereon; and

a magneto-optical modulator carried on said wave guide laser adjacent the moving record and having an index of refraction n_1, the indices of refraction having the relationships

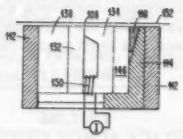
$$n_1 > n_2 > n_3.$$

4,037,264

MAGNETIC HEAD HOUSING WITH WEDGE LOCKING MEANS

John Allen Barkley; Neil Lloyd Robinson, and Frank Boyd Shelledy, all of Boulder County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 616,975, Sept. 26, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,422
Int. Cl.[2] G11B 5/105
U.S. Cl. 360—129 16 Claims



1. A magnetic head structure comprising:

a shell defining an opening including an inner wall surface;

a first rigid transducer element located within said shell, said element including a surface portion abutting the inner wall surface of said shell, said element also including a second surface portion generally opposed to its first surface portion;

a second rigid transducer element located within said shell, said element including a first surface portion juxtaposed to said second surface portion of said first element, an insulating layer between the second surface of the first element and the first surface of said second element and in contact with both said surfaces, said second element also including a second surface portion generally opposed to its first surface, said juxtaposed surface portions of said first and second transducer elements defining a transducing gap;

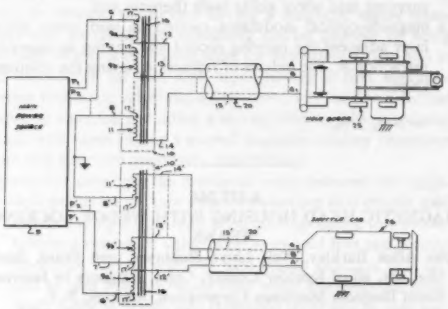
transducer elements positioniong and locking means including a wedge follower surface located within said shell, and a wedge, said wedge and said wedge follower surface carrying means located within said shell, each including a first face portion in abutting and sliding relationship to one another and each having a second surface portion generally opposed to their respective first surface portions, said second surface portions also generally opposed to said transducing gap and said inner wall surface of said shell respectively, said positioning elements engaging said second transducer element and a portion of said shell inner wall surface to transmit a lateral force positioning and locking all of said elements within the inner wall surfaces of said shell and wherein the wedge in generally planar and the wedge angle of said wedge is θ and is defined by the formula $\tan \theta \leqq$ the coefficient of friction between the wedge and wedge follower abutting surfaces.

4,037,265

ARC PREVENTING POWER SUPPLY SYSTEM

Henry D. Smith, Bluefield, W. Va., assignor to Pemco Corporation, Tazewell County, Va.

Filed Nov. 25, 1975, Ser. No. 635,386
Int. Cl.² H02H *3/16*
U.S. Cl. 361—58 **8 Claims**



1. In a power system for supplying electrical power from a main source of power to at least two separate loads each having a conductive external housing, wherein the system employs an inductive reactor in series with a grounding conductor connected between a conductive external housing and earth ground, the improvement comprising means for substantially balancing out or cancelling the self-inductance of said reactor upon the occurrence of a short circuit causing current to flow through said reactor.

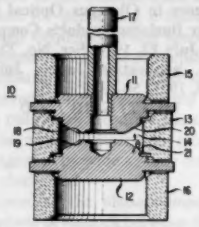
4,037,266

VOLTAGE SURGE PROTECTOR

John Hershel English, North Plainfield; James Edward Griffiths, Murray Hill, both of N.J., and Paul Zuk, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1975, Ser. No. 645,073
Int. Cl.² H02H *3/22*
U.S. Cl. 361—120 **2 Claims**

1. An overvoltage surge protector comprising a first electrode and a second electrode and a housing for maintaining the first electrode and the second electrode in spaced relationship to one another and electrically insulated from one another, the said electrodes each possessing a broad face defining a gap therebetween wherein the broad face of at least one of the electrodes is so contoured as to provide a narrow gap portion adapted for initiating the protective discharge and a wider gap portion adapted for receiving and sustaining the protective discharge, whereby an arc is initiated in the narrow gap portion and transfers to the wider gap portion during the protective discharge, wherein at least one of said electrodes, at said broad face, includes a flat inner portion at least 0.5 square millimeters in area, defining a uniformly spaced gap and a



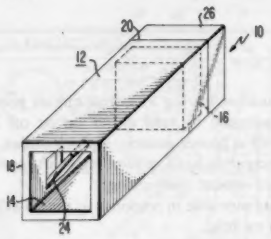
tapered outer portion defining an outwardly increasing gap, surround the inner portion and wherein the tapered outer portion defines a frustrum of a cone with a slope of 5° to 15°.

4,037,267

PACKAGE FOR SEMICONDUCTOR COMPONENTS

Thaddeus William Kisor, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,268
Int. Cl.² H05F *3/02*
U.S. Cl. 361—220 **9 Claims**



1. A package for semiconductor components comprising:
a hollow body having openings at a first end and a second end;
at least one protrusion extending into said opening at said first end of said body, said protrusion being an integral portion of said body and preventing the ingress or egress of said components through said opening at said first end; and
a coating of anti-static material covering said body.

4,037,268

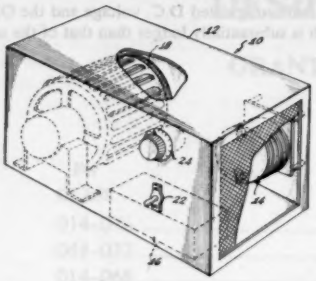
METHOD AND APPARATUS FOR GENERATING A NEGATIVE CHARGE EFFECT IN AN ENVIRONMENT

James Cyril Gallagher, Encino, Calif., assignor to Apsee, Inc., San Diego, Calif.

Continuation of Ser. No. 431,099, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 787,872, Dec. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 394,103, Sept. 2, 1964, abandoned, which is a continuation of Ser. No. 251,616, Jan. 15, 1963, abandoned. This application Mar. 12, 1975, Ser. No. 557,869
Int. Cl.² H01J *3/04*
U.S. Cl. 361—231 **8 Claims**

1. An electrical discharge generator comprising:
at least two electrode units each having an electrically conductive plate covered by a dielectric material, said electrode units being in a spaced parallel relationship and the facing surfaces of said electrode units having high coefficients of secondary electron emission; and

means for applying an electrical potential between said electrode units, said electrical potential being sufficient to



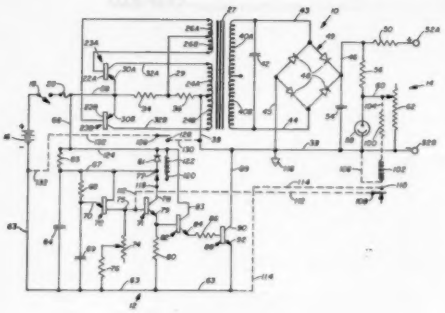
generate a glow type of discharge between said facing surfaces.

4,037,269

APPARATUS FOR CHARGING FIELD ELECTRICAL CABLES

Paul M. Ferguson, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Mar. 16, 1976, Ser. No. 667,407
Int. Cl.² H05C *1/04*
U.S. Cl. 361—232 **16 Claims**



1. In a cable having at least one conductor under a jacket, said conductor having low and variable capacitive impedance to ground, and means for applying a series of time-spaced high potential pulses to said conductor, for the purpose of discouraging animals from biting into said cable, comprising:

a cable charger for generating said high potential pulses to be applied to said at least one conductor, comprising;

a. a source of electrical power;

b. power conversion means responsive to said source of power for generating said series of time-spaced high potential pulses of selected magnitude;

c. power connecting means connected between said power source and said power conversion means;

d. timing means to enable said power connecting means at first selected time intervals to apply said power source to said energy conversion means;

e. said high potential pulses of a form that increase in magnitude of potential with time;

f. means to determine the instantaneous magnitude of said high potential pulses; and

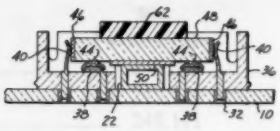
g. responsive to said instantaneous magnitude of said high potential pulses, means to disable said power connecting means to remove said power source from said power conversion means.

4,037,270

CIRCUIT PACKAGING AND COOLING

Gerald L. Ahmann, St. Paul; Douglas M. Carlson, Anoka; Warren B. Marquardt, Stillwater; Richard E. Offerdahl, Shoreview; Roger A. Paulson, and Anthony A. Vacca, both of New Brighton, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed May 24, 1976, Ser. No. 689,215
Int. Cl.² H05K *7/20*
U.S. Cl. 361—385 **11 Claims**



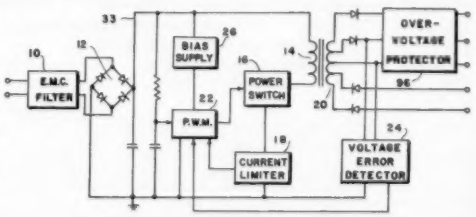
1. A circuit assemblage comprising, in combination: a circuit board; a plurality of groups of electrical connectors supported on said circuit board; fluid conduit means supported on a surface of said board and extending through each of said groups of connectors, said conduit means being constructed of a thermally conductive material and being adapted to carry a coolant; a plurality of carrier means each supporting a plurality of electrical contacts, each of electrical contacts of each of said carrier means being assembled to respective connectors of respective groups of connectors so that each of said carrier means is juxtapositioned to the portion of said conduit means extending through the respective group of connectors; a plurality integrated circuit means, each supported by a respective one of said carrier means, said circuit means each including a plurality of electrical contacts so disposed on arranged as to establish electrical connection to individual contacts of the respective carrier means, said circuit means further including a heat dissipating bar disposed and arranged as to establish thermal contact to the respective portion of said conduit means; and fastener means fastened to each of said carrier means, said fastener means including bias means for biasing the respective circuit means so that the respective heat dissipating bar bears against the respective portion of said conduit means, and the respective contacts on said circuit means bears against respective contacts on the carrier means.

4,037,271

SWITCHING REGULATOR POWER SUPPLY

Richard A. Keller, Palo Alto, Calif., assignor to Boschert Associates, Sunnyvale, Calif.

Filed Dec. 3, 1976, Ser. No. 747,229
Int. Cl.² H02M *3/335*
U.S. Cl. 363—21 **7 Claims**



1. A switching regulator power supply for converting electrical power at an unregulated voltage into regulated D.C. at desired voltage levels, said supply comprising:

rectifying means coupled to receive the electrical power for rectifying said power to produce an unregulated D.C. voltage and a ground reference;

a power conversion transformer having a primary winding and a center-tapped secondary winding, the first end of

said primary winding being coupled to the unregulated D.C. voltage output of said rectifying means;

electrical switching means coupled between the second end of said primary winding and said ground reference; and

a pulse-width modulator coupled between said unregulated D.C. voltage and ground reference and coupled to control the operation of said electrical switching means, said pulse-width modulator including an oscillator having a duty cycle, the ON-time of which is determined by amplitude of said unregulated D.C. voltage and the OFF-time of which is substantially longer than that of the said ON-time.

DESIGN PATENTS

GRANTED JULY 19, 1977

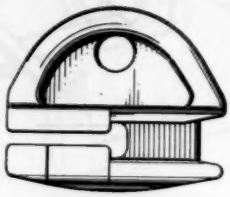
ERRATA

For CLASS	See PATENT NO.
014–076	245,065
048–033	245,110
014–068	245,111
014–060	245,112
014–060	245,113
030–014	245,114
030–037	245,115
024–032	245,118
024–058	245,119
024–060	245,120
029–006	245,121
024–008	245,122
024–017	245,123
028–035	245,124

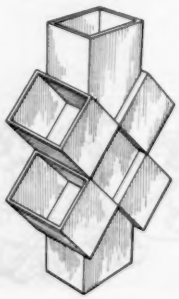
DESIGNS

JULY 19, 1977

245,046
SLIDER BODY FOR A SLIDE FASTENER
Stanley E. Weikal, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.
Filed Aug. 6, 1975, Ser. No. 602,351
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

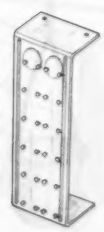


245,047
DISPLAY STAND FOR CONFECTIONARY PRODUCTS
Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy
Filed Mar. 31, 1976, Ser. No. 672,213
Claims priority, application Italy, Oct. 8, 1975, 53398/75
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—25



245,048
ROTATABLE HOLDER FOR INDIVIDUALLY DISPENSING PAPER CUPS OR THE LIKE
Albert E. Pool, Fort Worth, Tex., assignor to Modular Engineering Corporation, Atlanta, Ga.
Filed June 1, 1976, Ser. No. 691,522
Term of patent 14 years
Int. Cl. D6—*04*; D9—*99*
U.S. Cl. D6—25

245,049
EYEGLASS LENS DISPLAY UNIT
Richard S. Dunchock, Northville, Mich., assignor to Optarac Corporation, Hollywood, Fla.
Filed Feb. 5, 1976, Ser. No. 655,471
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



245,050
DISPLAY UNIT
Richard S. Dunchock, Northville, Mich., assignor to Optarac Corporation, Hollywood, Fla.
Continuation-in-part of Ser. No. 498,542, Aug. 19, 1974. This application Feb. 5, 1976, Ser. No. 655,402
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

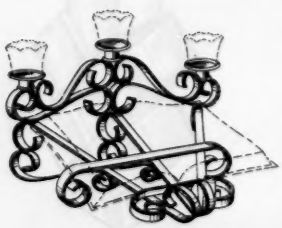
245,051
TELEVISION SUPPORT
Ismael Gomberoff, P.O. Box 262, Lynden, Wash. 98264
Filed July 9, 1975, Ser. No. 594,339
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85

245,052
PLANTER
Marion R. Mulford, Maitland, Fla., assignor to 4-M Enterprises
Filed Apr. 26, 1976, Ser. No. 680,574
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D6—113

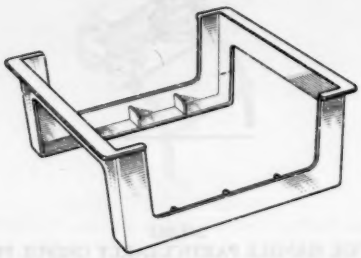
245,053
TENNIS RACKET HOLDER
George M. Domansky, 5037 Montclair Road, Stone Mountain, Ga. 30087
Filed Nov. 9, 1976, Ser. No. 740,233
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—114

245,054
DESK OR SIMILAR ARTICLE
Roger K. Leib, 11740 Wilshire Blvd., Los Angeles, Calif. 90025
Filed Oct. 20, 1975, Ser. No. 624,046
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

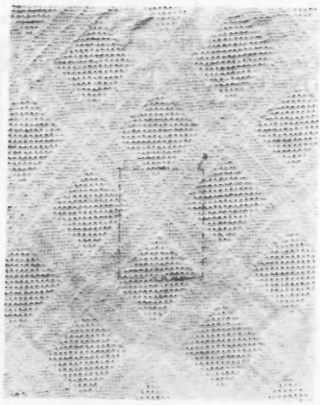
245,055
BOOK SUPPORT STAND OR SIMILAR ARTICLE
Linda C. Brown, 1940 Cameo, Clovis, N. Mex. 88101
Filed Dec. 2, 1975, Ser. No. 636,965
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—184



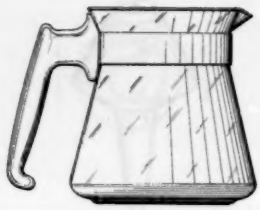
245,056
RECORD STAND
Ole Winther, Kopenhamn, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden
Filed Nov. 4, 1975, Ser. No. 628,702
Claims priority, application Sweden, May 7, 1975, 75984
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185



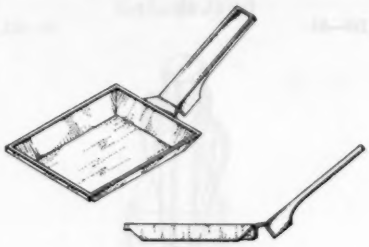
245,057
BEDSPREAD/BLANKET
Adolphe Couturier, Dalton, Ga., assignor to Crown Crafts, Inc., Calhoun, Ga.
Continuation-in-part of Ser. No. 680,053, April 26, 1976, abandoned. This application Oct. 5, 1976, Ser. No. 729,791
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—263



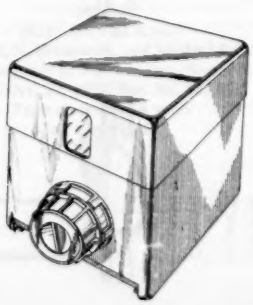
245,058
CARAFE OR SIMILAR ARTICLE
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed July 28, 1975, Ser. No. 599,416
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64



245,059
CREPE PAN
Robert S. Bardin, 409 Onda, Newport Beach, Calif. 92660
Filed Nov. 10, 1975, Ser. No. 630,692
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95



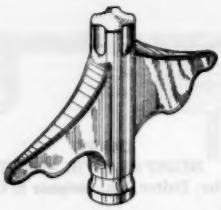
245,060
GRANULAR COFFEE DISPENSER ATTACHMENT FOR A BEVERAGE MAKER OR SIMILAR ARTICLE
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed July 28, 1975, Ser. No. 599,417
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—129



245,061
PLANT FEEDING DEVICE
Philip B. Knapp, Lynbrook, N.Y., assignor to Hortigro, Inc., Lynbrook, N.Y.
Filed Nov. 12, 1975, Ser. No. 630,991
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—1

245,062
TOOL HANDLE PARTICULARLY USEFUL FOR SCREWDRIVERS
Frank M. Grame, 6606 S. Lincoln St., Littleton, Colo. 80120
Filed Mar. 22, 1976, Ser. No. 669,182
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83

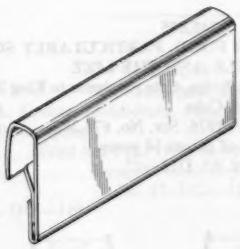
245,063
TOOL HANDLE PARTICULARLY USEFUL FOR SCREWDRIVERS
Frank M. Grame, 6606 S. Lincoln St., Littleton, Colo. 80120
Filed Mar. 5, 1976, Ser. No. 664,243
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83

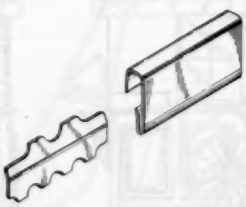


245,064
HAND GRIP
Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Filed Feb. 12, 1976, Ser. No. 657,594
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—303

245,065
PORTABLE MOUNT FOR CITIZEN BAND RADIOS
Edward T. Zick, 329 Dixieway North, South Bend, Ind. 46637
Filed July 26, 1976, Ser. No. 708,891
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D14—76

245,066
DISPLAY DEVICE FOR ATTACHMENT TO WIRE RACKS, OR SIMILAR ARTICLE
Ronald H. Taub, 1154 Sheridan Road, Highland Park, Ill. 60035
Filed Oct. 12, 1976, Ser. No. 731,844
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—361



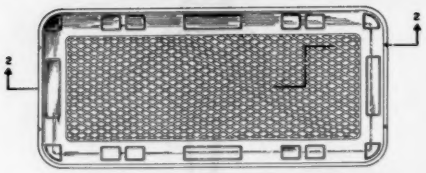


245,067
TAMPER RESISTANT NUT
Chester P. Coldren, Canton, Ohio, assignor to Eaton Corporation
Filed June 19, 1975, Ser. No. 588,280
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

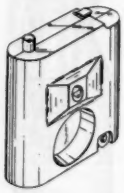
245,068
BOTTLE
Salvatore Ruriani, Elmira, N.Y., assignor to Excello Food Products, Inc., Melrose Park, Ill.
Filed July 3, 1975, Ser. No. 593,005
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—96

245,069
SUTURE PACKAGE
Harvey B. Mandel, N. Brunswick, and Michael Schuler, Edison, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Oct. 20, 1975, Ser. No. 623,862
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

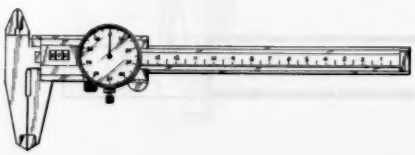
245,070
PACKAGING TRAY FOR MEAT OR THE LIKE
Wayne L. Congleton, Walnut, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.
Filed Oct. 15, 1975, Ser. No. 622,542
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



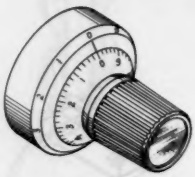
245,071
COMBINED TAPE MEASURE, FLASHLIGHT, MAGNIFIER AND MULTIPURPOSE TOOL HOLDER
Woo Hou Kong, 146 Wai Yip Street, (5th Floor), Unit E, Kwun Tong, Kowloon, Hong Kong
Filed Aug. 19, 1975, Ser. No. 605,826
Claims priority, application United Kingdom, Jan. 16, 1975, 969455/75
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



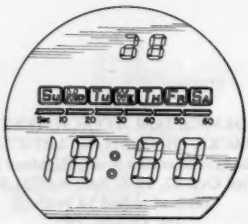
245,072
CALIPERS
Kouzo Shibukawa, Kawasaki, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Sept. 24, 1975, Ser. No. 616,223
Claims priority, application Japan, Dec. 23, 1974, 49-44795
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



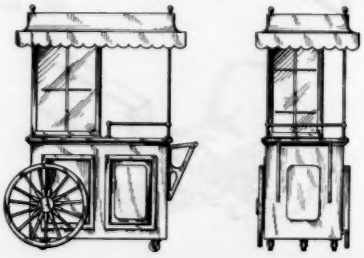
245,073
KNOB FOR TURNS-COUNTING DIAL
Anthony E. Taylor, P.O. Box D, La Verne, Calif. 91750
Filed Mar. 29, 1976, Ser. No. 671,142
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103



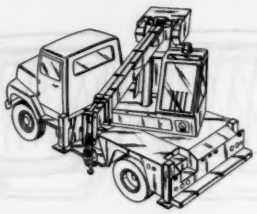
245,074
DIGITAL WATCH DIAL
Susumu Karibe, Matsudo; Midori Miyata, and Eiichi Osawa, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan
Filed Aug. 11, 1975, Ser. No. 603,307
Claims priority, application Japan, Feb. 19, 1975, 50-6653
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—124



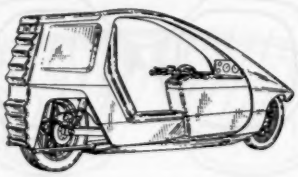
245,075
DISPLAY CART FOR FOOD, PARTICULARLY SOFT PRETZELS, AND THE LIKE
Charles K. Austin, Wheat Ridge, Colo., assignor to King Pretzel Corporation, Lakewood, Colo.
Filed Apr. 7, 1976, Ser. No. 674,382
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—22



245,076
SELF PROPELLED CRANE
John W. Haswell, Belleville, Mich., assignor to Master Craft Engineering, Inc., Belleville, Mich.
Filed Apr. 2, 1976, Ser. No. 672,869
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57

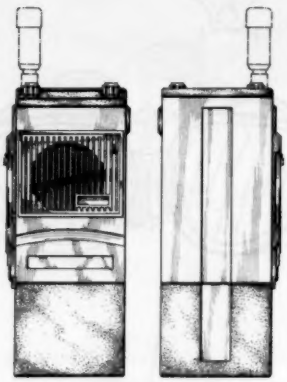


245,077
MOTORCYCLE
Malcolm Adam Newell, Calne, England, assignor to Quasar Motorcycles Limited, Calne, England
Filed Feb. 20, 1976, Ser. No. 659,734
Claims priority, application United Kingdom, Aug. 22, 1975, 972317/75
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

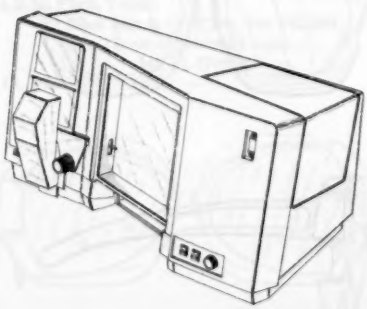


245,078
CYCLE BACK REST
Elmer L. Greene, Middleburg, Fla., assignor to Florida Cycle Supply Company
Filed Sept. 22, 1975, Ser. No. 615,746
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—119

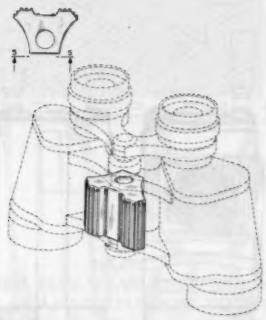
245,079
HOUSING FOR A PORTABLE RADIO COMMUNICATION UNIT
Arthur W. Judd, Seminole County, and Walter C. Simciak, Longwood, both of Fla., assignors to Scope Incorporated, Reston, Va.
Filed Oct. 19, 1976, Ser. No. 733,931
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



245,080
MICROFILM READER/PRINTER OR THE LIKE
Andrew V. McClare, Rochester, and Edward B. Schoonmaker, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 14, 1975, Ser. No. 622,587
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—28

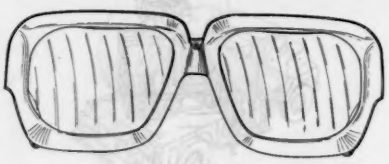


245,081
ZOOM OR FOCUS CONTROL KNOB FOR BINOCULARS
James Gerdom, 9200 Cody, Overland Park, Kans. 66214
Filed July 12, 1976, Ser. No. 704,188
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59



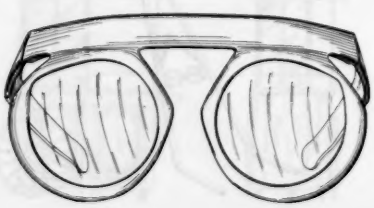
245,082
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed Oct. 14, 1975, Ser. No. 622,112
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

245,083
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,688
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



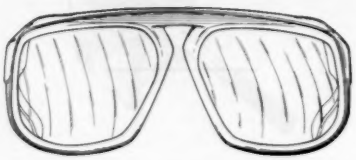
245,084
EYEGLASS FRAME
Hilde Zimmerman, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,689
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

245,085
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,690
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

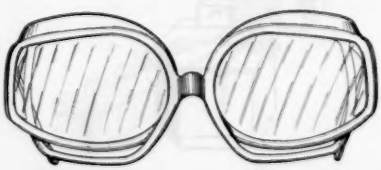


245,086
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,779
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

245,087
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,851
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



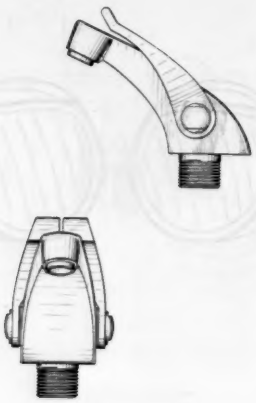
245,088
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,852
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



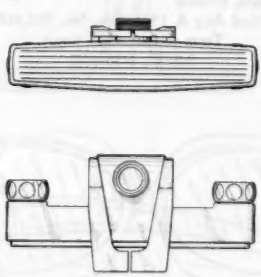
245,089
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,853
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

245,090
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,869
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

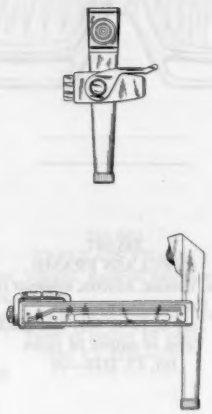
245,091
FAUCET
Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway
Filed Nov. 12, 1975, Ser. No. 631,465
Claims priority, application Norway, May 16, 1975, 7556653
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



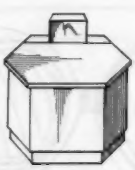
245,092
FAUCET
Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway
Filed Nov. 13, 1975, Ser. No. 631,602
Claims priority, application Norway, May 16, 1975, 7556657
Term of patent 3½ years
Int. Cl. D23—*0*
U.S. Cl. D23—26



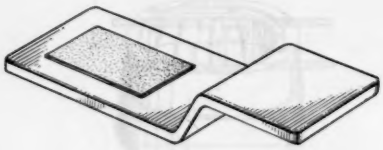
245,093
COMBINED FAUCET AND HAND SHOWER
Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway
Filed Nov. 14, 1975, Ser. No. 632,163
Claims priority, application Norway, July 24, 1975, 7556826
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—26



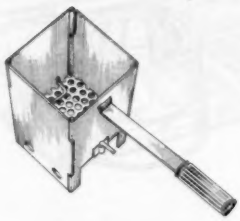
245,094
BIDET BOX
Simone Arial Zieman, Apt. 206, 161 Augusta Street, Ottawa, Ontario, Canada (K1N 8B6)
Filed Jan. 29, 1976, Ser. No. 653,390
Claims priority, application Canada, Nov. 18, 1975, 181175
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—51



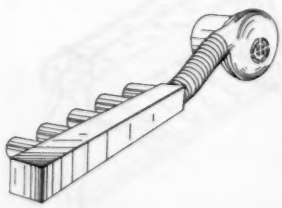
245,095
SANITARY TOILET SEAT LIFTER
Robert J. Murray, 860 Moraga Drive, Apt. 2, Bel Air, Calif. 90049
Filed Nov. 19, 1975, Ser. No. 633,254
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



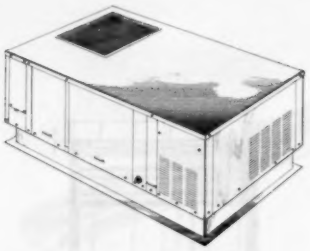
245,096
COLLAPSIBLE CHARCOAL LIGHTER
C. Arthur Heidelbach, 12 Simpson St., Geneva, Ill. 60134
Filed Aug. 11, 1976, Ser. No. 713,418
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—90.1



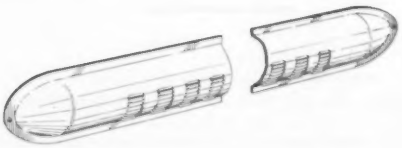
245,097
HOUSING FOR HEAT DISPENSER FOR A TUBULAR FIREPLACE HEATER
Donald A. Boyd, Euclid, Ohio, assignor to Production Experts, Inc., Cleveland, Ohio
Filed Apr. 28, 1975, Ser. No. 572,148
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



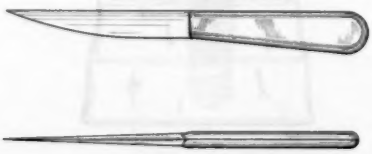
245,098
ROOF-MOUNTED BUILDING FRESH AIR VENTILATOR
Herbert M. Kay, Waco, Tex., assignor to Command-Aire Corporation, Waco, Tex.
Filed Mar. 17, 1975, Ser. No. 559,068
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



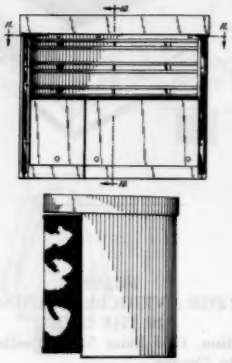
245,099
VENTILATOR FOR A VEHICLE, HOUSING STRUCTURE OR THE LIKE
Wilfred W. Wilson, 1055 Bloor St. E. Penthouse 12, Mississauga, Ontario, Canada
Filed Apr. 10, 1975, Ser. No. 566,728
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—164



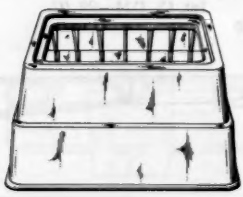
245,100
INTERDENTAL CLEANSER AND STIMULATOR
Bernard Russell Venning, 11 Russell Ave., Plymouth, Devon, England
Filed Sept. 30, 1974, Ser. No. 511,297
Claims priority, application United Kingdom, Mar. 28, 1974, 966/74
Term of patent 3½ years
Int. Cl. D24—*99, 02*
U.S. Cl. D24—10



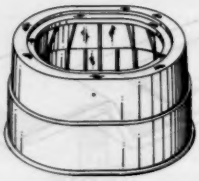
245,101
COMBINED NEWSSTAND AND REMOVABLE WINDSCREENS
Robert A. Spillman; Charles H. Klein, both of Bethlehem; Frederick C. Savage, and Edwin M. Simon, both of Philadelphia, all of Pa., assignors to Bulletin Company, Philadelphia, Pa.
Filed Sept. 8, 1975, Ser. No. 611,316
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16



245,102
UNDERGROUND UTILITY HOUSING
Walter H. Gross, Campbell, Tex., assignor to Burton B. Jones, Midland, Tex., a part interest
Filed Jan. 30, 1976, Ser. No. 653,642
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—36

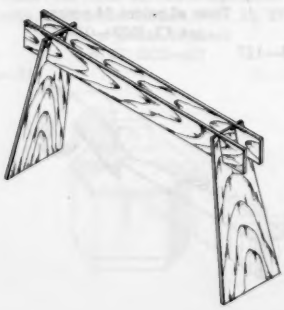


245,103
UNDERGROUND UTILITY HOUSING
Walter H. Gross, Campbell, Tex., assignor to Burton B. Jones, Midland, Tex., a part interest
Filed Jan. 30, 1976, Ser. No. 653,643
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—36



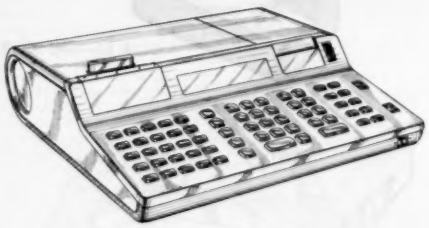
245,104
UNDERGROUND UTILITY HOUSING
Walter H. Gross, Campbell, Tex., assignor to Burton B. Jones, Midland, Tex., a part interest
Filed Jan. 30, 1976, Ser. No. 653,644
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—36

245,105
SAW HORSE
Richard J. Rader, 3005 S. Harbor, Santa Ana, Calif. 92704
Filed Nov. 20, 1975, Ser. No. 630,690
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D25—67



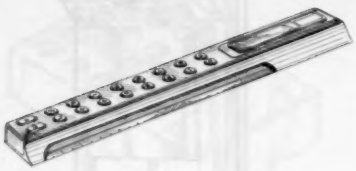
245,106
PANEL MEMBER FOR MOUNTING WALL AND CEILING PANELS
Lloyd J. Scheid, 4404 Grimes Place, Encino, Calif. 91316
Filed Mar. 4, 1976, Ser. No. 663,777
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76

245,107
ELECTRONIC CALCULATOR
Barry R. Mathis, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 1, 1975, Ser. No. 618,670
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



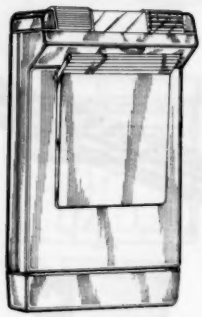
245,108
CALCULATOR
John Hunter Pemberton, Cambridge, England, assignor to Sinclair Radionics Limited, Huntingdon, England
Filed May 6, 1976, Ser. No. 683,748
Claims priority, application United Kingdom, Nov. 10, 1975, 973165/75
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

245,109
DESK TOP CALCULATOR WITH SCALE
Eiichi Yoshioka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed June 9, 1976, Ser. No. 694,175
Claims priority, application Japan, Dec. 10, 1975, 50-48579
Term of patent 14 years
Int. Cl. D18—*01*; D10—*04*
U.S. Cl. D64—11 B



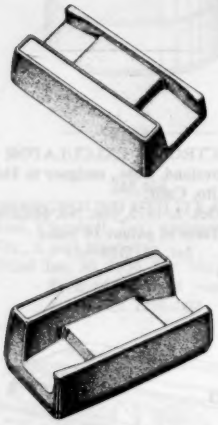
245,110
LAMP
Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan
Filed May 20, 1976, Ser. No. 688,245
Claims priority, application Japan, Dec. 3, 1975, 50-47589
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—33

245,111
STAFF LOCATOR
Peter Maddock, Sollentuna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed July 28, 1975, Ser. No. 599,609
Claims priority, application Sweden, Feb. 10, 1975, 7500031
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



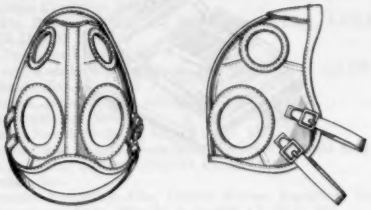
245,112
TELEPHONE STATION SET BASE
Joseph Robert Everhart, Holmdel; Donald Michael Genaro, Haworth; John Hale Liebe, Colts Neck, all of N.J.; Gordon Elliot Sylvester, Jamaica, N.Y.; Alvin Richard Tilley, Red Bank, and James Thomas Walker, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,854
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

245,113
TELEPHONE STATION SET BASE
Donald Michael Genaro, Haworth, N.J.; Gordon Elliot Sylvester, Jamaica, N.Y., and Alvin Richard Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,855
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

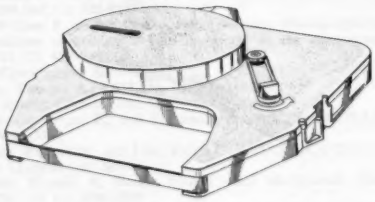


245,114
BIRD FEEDER
Roland D. Vaughn, 6321 NW. 110th St., Hialeah, Fla. 33012
Filed Dec. 3, 1976, Ser. No. 747,471
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14

245,115
PROTECTIVE MASK FOR A HORSE
Allen Dale Centers, deceased, late of Arcadia, Calif., by Alta A. Centers, administratrix, 222 E. Foothill Blvd., Arcadia, Calif. 91006
Filed Aug. 20, 1975, Ser. No. 606,288
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—37

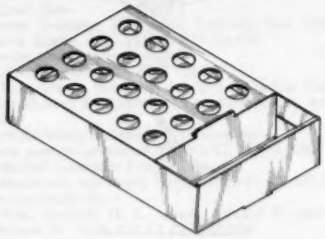


245,116
RIBBON CARTRIDGE
Richard D. Trezise, Newark, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 25, 1975, Ser. No. 607,656
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



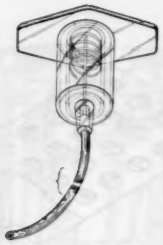
245,117
TYPEWRITING MACHINE
Ettore Sottsass, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy
Filed Sept. 24, 1975, Ser. No. 616,377
Claims priority, application Italy, Mar. 27, 1975, 52988/75
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

245,118
TRANSPORT RACK FOR SPECIMEN TUBES
George Norman Heaton, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed July 21, 1975, Ser. No. 597,358
Term of patent 14 years
Int. Cl. D24—*01*; D9—*99*
U.S. Cl. D24—32

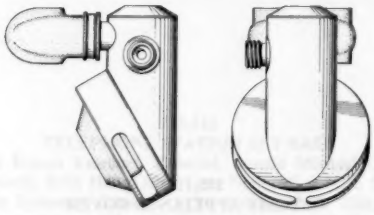


245,119
OSTOMY APPLIANCE COVER
Eugene L. Harris, 1717 W. Romneya No. E, Anaheim, Calif. 92801
Filed Nov. 6, 1975, Ser. No. 629,407
Term of patent 14 years
Int. Cl. D2—*02*; D24—*02*
U.S. Cl. D24—58

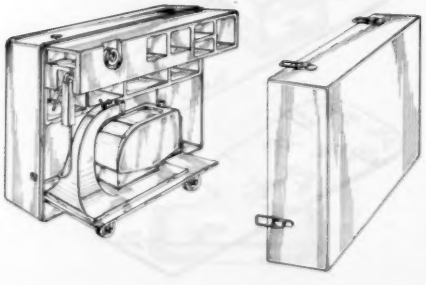
245,120
COMBINED SYRINGE-LARYNGOTRACHEAL CANNULA
Dean Richard Katerndahl, Wheaton, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Sept. 9, 1974, Ser. No. 504,575
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—60



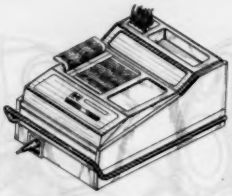
245,121
HOUSING FOR THE DEMAND REGULATOR OF A BREATHING APPARATUS
Raymond A. Christianson, P.O. Box 1513, Manhattan Beach, Calif. 90266
Filed Aug. 14, 1975, Ser. No. 605,019
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D83—1 L



245,122
ENCLOSABLE MOBILE BLOOD COLLECTION APPARATUS
Evan W. Rosen, Tucson, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.
Filed Sept. 11, 1975, Ser. No. 612,287
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

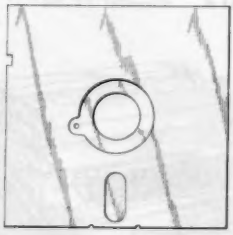


245,123
ELECTROCARDIOGRAPH
Gerald J. Reiser, 1820 W. Edgerton Ave., Milwaukee, Wis. 53221
Filed Oct. 1, 1976, Ser. No. 728,641
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17



245,124
CURLING IRON ATTACHMENT
Martin Jay Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.
Filed Jan. 12, 1976, Ser. No. 648,187
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35

245,125
FLEXIBLE MAGNETIC DISC CARTRIDGE
Albert S. Chou, 15208 Stratford Court, Monte Sereno; Donald J. Massaro, 121 Altura Vista, and Harold C. Medley, 18631 Blythswood Drive, both of Los Gatos, all of Calif. 95030
Filed June 1, 1976, Ser. No. 691,406
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—10



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JULY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A Campton & Sons Company Limited: *See*—
Hallam, Harry, 4,035,990, Cl. 53-222.000.

A. H. Robins Company, Inc.: *See*—
Alphin, Reevis Stancil; and Ward, John Wesley, 4,036,957, Cl. 424-232.000.

A. R. I. Propaflor Limited: *See*—
Harvey, Ronald William Stanley, 4,035,967, Cl. 52-126.000.

AB Stathmos: *See*—
Hellkvist, John William, 4,036,317, Cl. 177-209.000.

Abbott Laboratories: *See*—
Genese, Joseph Nicholas, 4,036,232, Cl. 128-278.000.

Abe, Kiyomi; and Tagata, Genichi, to Pentel Kabushiki Kaisha. Response analyzing device. 4,035,933, Cl. 35-48.00R.

Abe, Toshio: *See*—
Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl. 58-85.500.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to Ayerst McKenna and Harrison Ltd. Cyclopentanone derivatives. 4,036,856, Cl. 260-343.30R.

ACF Industries, Incorporated: *See*—
Dugge, Richard H., 4,036,408, Cl. 222-193.000.
Waddell, Jerry D.; and Scheeter, John J., 4,036,532, Cl. 302-53.000.

Acoustic Emission Technology Corporation: *See*—
Morais, Carroll F., 4,036,057, Cl. 73-88.00R.

Action Packaging Corporation: *See*—
Kugler, Robert J., 4,036,363, Cl. 206-526.000.

Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for preparing vaccine adjuvant. 4,036,953, Cl. 424-92.000.

Adams, Kenneth Waldock. Medicinal insert instrument. 4,036,230, Cl. 128-269.000.

Adams, Sally Lee: *See*—
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,036,660, Cl. 106-90.000.

Adams, William R., to Sun Chemical Corporation. Photopolymerizable compositions containing a keto dioxolane as the photosensitizer. 4,037,021, Cl. 428-522.000.

Admiral Corporation: *See*—
Costa, Thomas A., 4,037,256, Cl. 358-248.000.

Aerojet-General Corporation: *See*—
Anderson, Roger E.; and Schmauderer, Emil, Jr., 4,036,434, Cl. 239-8.000.
Bodley, Robert W.; and Ulm, Reign C., 4,036,394, Cl. 220-222.000.

Aerospan Corporation: *See*—
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 4,036,519, Cl. 296-1.00S.

Aeschbach, Stefan H.: *See*—
Gembicki, Stanley A.; and Aeschbach, Stefan H., 4,036,784, Cl. 252-465.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000.
Deficis, Alain, 4,036,060, Cl. 73-368.000.

Agency of Industrial Science & Technology: *See*—
Aisaka, Noboru; Shindo, Tadashi; and Kawakami, Tatsuya, 4,036,034, Cl. 66-50.00R.
Ohmae, Tsutomu; Yano, Hideo; and Suzuki, Toshio, 4,037,144, Cl. 318-338.000.
Okumura, Kimio; Soya, Tatsunori; Kauchi, Yosuke; and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000.

AGFA-Gevaert, A.G.: *See*—
Hellmig, Ehrhard; and Ranz, Erwin, 4,036,646, Cl. 96-74.000.
Wagner, Karl; and von Fischern, Bernhard, 4,037,232, Cl. 354-23.00R.

Agsten, Carl F. Wind driven electric power generator. 4,036,916, Cl. 261-109.000.

Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., to Control Data Corporation. Circuit packaging and cooling. 4,037,270, Cl. 361-385.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Current-responsive threshold detection circuitry. 4,037,155, Cl. 324-133.000.

Aiba, Masahiko: *See*—
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 4,037,230, Cl. 346-75.000.

Air Data, Inc.: *See*—
Foster, George B.; and Gibbs, Paul Douglas, 4,037,086, Cl. 235-150.220.

Aisaka, Noboru; Shindo, Tadashi; and Kawakami, Tatsuya, to Agency of Industrial Science & Technology. Electronic method and apparatus for pattern formation in circular knitting machine. 4,036,034, Cl. 66-50.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Kondo, Toshiyuki; and Nagashima, Takashi, 4,036,534, Cl. 303-6.00R.

Aizawa, Kazuo: *See*—
Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.

Ajax Magnethermic Corporation: *See*—
Havas, George, 4,037,044, Cl. 13-26.000.

Akiyama, Takayuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Safety device for locking a plurality of operation levers. 4,036,077, Cl. 74-526.000.

Aktiebolaget Karlstads Mekaniska Werkstad: *See*—
Pehrsson, Anders Lennart, 4,036,163, Cl. 115-34.00R.

Aktiengesellschaft Gebruder Loepfe: *See*—
Stutz, Hansruedi; and Spani, Hans, 4,036,445, Cl. 242-37.00A.

Akzona Incorporated: *See*—
Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., 4,036,898, Cl. 260-649.00R.

Alberto, Delfin Perez: *See*—
Fernandez, Carlos M. Cruz; Valdes, Rogelio Rodriguez; and Alberto, Delfin Perez, 4,035,996, Cl. 56-13.900.

Alcalde Pecero, Francisco. Container that can be displaced by rotary force. 4,036,254, Cl. 137-581.000.

Alcan Research and Development Limited: *See*—
Braun, Johannes; and Sturm, Winfried, 4,035,981, Cl. 53-21.00R.

Aldorfer, Louis. Vacuum-operated reciprocating engine. 4,036,016, Cl. 60-325.000.

Aldridge, Bobby V.; and Spector, George. Electro-lunch bucket. 4,037,081, Cl. 219-387.000.

Alexander, Jerry L. Touch controlled switch assembly. 4,037,221, Cl. 340-258.00C.

Alexander, Merwin K.; Meyer, Daniel J.; and Cohen, Philip, to Optical Associates, Inc. Instrument swivel bracket. 4,036,459, Cl. 248-11.000.

Alfredsson, Sara Inga-Lill: *See*—
Shishoo, Roshan Lal; and Alfredsson, Sara Inga-Lill, 4,036,924, Cl. 264-89.000.

Algier, Joseph C. Dining table service assembly. 4,036,150, Cl. 108-50.000.

Alig, Leo; Furst, Andor; and Muller, Marcel, to Hoffmann-La Roche Inc. D-homopregnanes. 4,036,874, Cl. 260-488.00B.

Allard, G. D. Skip: *See*—
Saunders, Leonard R.; and Allard, G. D. Skip, 4,036,539, Cl. 308-4.00A.

Allen, Charles B. Channel receptacle tray for finished photocopies. 4,036,488, Cl. 271-186.000.

Allen, Curtiss B. Fork lift truck tote box dumper. 4,036,383, Cl. 214-313.000.

Allen, Richard J.; and Shields, Michael A., to Signetics Corporation. Integrated circuit having guard ring Schottky barrier diode and method. 4,035,907, Cl. 29-590.000.

Allen, Robert M.; and Seyffert, Michael, to National Semiconductor Corporation. Wheel selective jet plating system. 4,036,725, Cl. 204-206.000.

Allen, Timothy Darrell; and Hamaker, Weston. Upholstery and the like staple remover. 4,036,471, Cl. 254-28.000.

Allied Chemical Corporation: *See*—
Ray, Ranjan; and Kavesh, Sheldon, 4,036,638, Cl. 75-123.00B.

Allis-Chalmers Corporation: *See*—
Hamilton, William I., deceased, 4,036,196, Cl. 123-140.00R.

Allison, Robert E.: *See*—
Dixon, Robert L.; and Allison, Robert E., 4,036,314, Cl. 175-364.000.

Allport, John J., to Nucleonic Data Systems, Inc. Dual beam X-ray thickness gauge. 4,037,104, Cl. 250-359.000.

Almagro, Guillermo A.: *See*—
Williams, Lloyd E.; and Almagro, Guillermo A., 4,036,663, Cl. 106-308.00B.

Alpha Industries, Inc.: *See*—
Borzym, Alexander, 4,036,091, Cl. 83-319.000.

Alphin, Reevis Stancil; and Ward, John Wesley, to A. H. Robins Company, Inc. Phenoxy compounds in combinations to suppress gastric bleeding in aspirin therapy. 4,036,957, Cl. 424-232.000.

Alto Corporation: *See*—
White, David Laverne, 4,036,352, Cl. 198-778.000.

Alza Corporation: *See*—
Theeuwes, Felix, 4,036,228, Cl. 128-260.000.
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,036,227, Cl. 128-260.000.

Amano, Yoshifumi, to Sony Corporation. Signal storing and read-out

arrangement of video display system with a crossed-grid flat display panel. 4,037,224, Cl. 340-324.00M.

Amato, Jose; Propker, Marta; Pongracz, Magdalena Julia Beatriz; and Szabo, Jorge Luis Jose. Mono substituted malonic acid diamides and process of preparing them. 4,036,985, Cl. 424-320.000.

Amberg, Stephen W.; and Landers, Frank S., to Owens-Illinois, Inc. Film-lined foam plastic receptacles and laminated materials and methods for making the same. 4,036,675, Cl. 156-245.000.

Ambrose, Everett J., to Monsanto Company. Unitized palletless load and method of forming same. 4,036,364, Cl. 206-526.000.

AMC Industries, Inc.: *See*—
Woltjen, Duane W., 4,036,374, Cl. 214-1.0BB.

Amerace Corporation: *See*—
Newnom, Richard S., 4,035,859, Cl. 10-72.00R.

Amerada Hess Corporation: *See*—
Edge, George S., 4,035,861, Cl. 14-71.100.

American Air Filter Company, Inc.: *See*—
Bennett, Robert L.; Parrott, Orville C.; Getzin, Allan R.; and McClain, A. Ervin, 4,036,611, Cl. 55-149.000.

American Cyanamid Company: *See*—
Asato, Goro, 4,036,979, Cl. 424-275.000.
Boyles, Bruce K.; and Crow, John L., Jr., 4,036,941, Cl. 423-558.000.
Castellion, George Augustus; and Marzluff, William Frank, 4,036,870, Cl. 260-465.300.
Curran, William Vincent; Tomcufcik, Andrew Stephen; and Ross, Adma Schneller, 4,036,849, Cl. 260-308.00D.
Lassiter, Marvin Stevens, Sr., 4,036,752, Cl. 210-46.000.

American Hoist & Derrick Company: *See*—
Strickland, Claudius R., Jr., 4,036,359, Cl. 206-83.500.

American Home Products Corporation: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,036,842, Cl. 260-293.580.
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,036,837, Cl. 260-250.0BN.

American Hydrocarbon Company: *See*—
Selin, Clifford E.; Proell, Wayne A.; and Applegate, James M., 4,036,934, Cl. 423-394.000.

American Motors Corporation: *See*—
DeRees, Delbert D.; and Pinsonneault, Jacques Emile, 4,036,522, Cl. 296-154.000.

American Optical Corporation: *See*—
Deeg, Emil W.; and Courtemanche, Richard D., 4,036,623, Cl. 65-30.00E.
Krohn, David A.; and Deeg, Emil W., 4,036,624, Cl. 65-30.00R.

American Standard, Inc.: *See*—
Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., 4,037,172, Cl. 331-94.50E.

American Sterilizer Company: *See*—
Brendgord, Thomas; and Fisher, Kenneth J., 4,037,096, Cl. 240-1.400.

Ammann, Paul R.; and Kim, Jonathan J., to Kennecott Copper Corporation. Pyrometallurgical process for smelting nickel and nickel-copper concentrates including slag treatment. 4,036,636, Cl. 75-74.000.

AMP Incorporated: *See*—
Over, William Roderick; and Brehm, Ronald Carl, 4,035,897, Cl. 29-56.600.

Ampex Corporation: *See*—
Busby, Edwin S., Jr.; and Oldershaw, Reginald W., 4,037,260, Cl. 360-73.000.

Anchor Hocking Corporation: *See*—
Clem, William E.; and Nolan, John F., 4,035,986, Cl. 53-61.000.

Andco Incorporated: *See*—
Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,036,726, Cl. 204-231.000.

Anderson, Bruce D., to Rockwell International Corporation. Disc brake with rotary cam actuated reciprocating pistons. 4,036,329, Cl. 188-72.700.

Anderson, Donald R. Purification of saline water. 4,036,749, Cl. 210-23.00H.

Anderson, John C., to International Harvester Company. Gear adjusting, locking, and pre-loading means. 4,036,076, Cl. 74-409.000.

Anderson, John H.; and Waters, Elmer D., to McDonnell Douglas Corporation. Permafrost stabilizing heat pipe assembly. 4,036,286, Cl. 165-45.000.

Anderson, John Harland. Photoelectrogenerative cell. 4,037,029, Cl. 429-111.000.

Anderson, Robert N.; and Parlee, Norman A., to Parlee-Anderson Corporation. Separation of zirconium-hafnium by nitride precipitation. 4,036,637, Cl. 75-84.000.

Anderson, Roger E.; and Schmauderer, Emil, Jr., to Aerojet-General Corporation. Fluid delivery nozzle with fluid purged face. 4,036,434, Cl. 239-8.000.

Anderson, William S., to Shell Oil Company. Block copolymers as viscosity index improvers for lubrication oils. 4,036,910, Cl. 260-879.000.

Ando, Toru: *See*—
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.

Ando, Yoshikazu; and Yokozato, Junichi, to Zenza Bronica Industries, Inc. Grip for a camera. 4,037,240, Cl. 354-212.000.

Andoh, Naoki: *See*—
Kawakami, Masato; Andoh, Naoki; Iio, Akira; and Yamanouchi, Haruo, 4,036,901, Cl. 260-669.00R.

Andre, Lee R., to Ford Motor Company. Hydraulic shock absorber for a motor vehicle having flow control valving that becomes more restrictive during the service life of the shock absorber. 4,036,319, Cl. 188-282.000.

Angell, William W.; and Yoon, David L., to Angell, William W. Heart valve stent and process for preparing a stented heart valve prosthesis. 4,035,849, Cl. 3-1.500.

Anselm, Anthony Cesar. Channel-like structure for horticulture and flower-growing. 4,035,950, Cl. 47-59.000.

Antonescu, Virgil: *See*—
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic sulfur-free multimetallic catalytic composite. 4,036,742, Cl. 208-139.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,036,743, Cl. 208-139.000.

Antos, George J., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,036,903, Cl. 260-673.500.

Aoki, Kanemasa, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Small-sized direct current rotary electric appliance. 4,037,125, Cl. 310-248.000.

Aoyama, Kozo; Iijima, Hiroshi; and Kikuchi, Shizuo, to Asahi-Dow Limited. Method and apparatus for wrapping goods in a stretchable film material. 4,035,985, Cl. 53-30.00R.

Applegate, James M.: *See*—
Selin, Clifford E.; Proell, Wayne A.; and Applegate, James M., 4,036,934, Cl. 423-394.000.

Apsee, Inc.: *See*—
Gallagher, James Cyril, 4,037,268, Cl. 361-231.000.

Arcilesi, Donald A.: *See*—
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,710, Cl. 204-52.00R.
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,711, Cl. 204-52.00R.

Ariga, Hajime, to Nissan Motor Co., Ltd. Method of reducing emission of pollutants from multi-cylinder engine. 4,036,014, Cl. 60-274.000.

Arjalies, Georges; and Guillais, Jean-Claude, to Les Traitements de Surface Nobel-Bozel. One-piece conductor roller for electrolytic processing of strip materials. 4,036,337, Cl. 191-1.00A.

Armbruster, Joseph M. Bathroom mirror defogger. 4,037,079, Cl. 219-219.000.

Armco Steel Corporation: *See*—
Kirkland, Kerry G.; Masciopinto, Anthony J.; and Owens, James H., 4,036,295, Cl. 166-.600.

Armitage, Bernard J.; and Nicholson, John S., to Boots Company Limited, The. Anti-inflammatory composition and method containing 2-fluoro-4-isopropylbiphenyl. 4,036,989, Cl. 424-353.000.

Arnblock, Lennart Oswald, to Flymo Societe Anonyme. Device for connecting a cutter unit to a frame of a powered lawnmower. 4,035,995, Cl. 56-11.600.

Artisan Industries Inc.: *See*—
Donovan, James, 4,036,759, Cl. 210-298.000.

Asahara, Hidetoshi, to Foseco International Limited. Process of ingot casting. 4,036,282, Cl. 164-123.000.

Asahi-Dow Limited: *See*—
Aoyama, Kozo; Iijima, Hiroshi; and Kikuchi, Shizuo, 4,035,985, Cl. 53-30.00R.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Chihiro, Oizumi; and Juno, Uesugi, 4,036,920, Cl. 264-.500.

Asato, Goro, to American Cyanamid Company. Compositions containing 4,5,6,7-tetrahydrobenz[b]thien-4-yl-ureas or derivatives and methods of enhancing growth rate. 4,036,979, Cl. 424-275.000.

Asayama, Kingo, to Kabushiki Kaisha Takechi Koumusho. Method and apparatus for establishing an anchor. 4,036,026, Cl. 61-56.500.

Asea Aktiebolag: *See*—
Soderberg, Bo, 4,037,143, Cl. 318-52.000.

Ashford Marine (J. L. Gmach) Limited: *See*—
Wyeth, Harold G.; and Gmach, John L. T. B., 4,035,851, Cl. 4-99.000.

Ashmead, Albert Sidney; Ross, William Alden; and Shepard, Richard Wilton, to Torrington Company, The. Latch needle for knitting machines. 4,036,036, Cl. 66-123.000.

Atack, James W.; Triano, Howie; and Zoretich, Peter. Novel trouser-like article of clothing. 4,035,844, Cl. 2-2.000.

Atherton, John Heathcote, to Imperial Chemical Industries Limited. Fluorine-containing organosilicon compounds. 4,036,807, Cl. 260-42.150.

Atherton, John Heathcote, to Imperial Chemical Industries Limited. Nitrogen-containing compounds and use thereof. 4,036,868, Cl. 260-448.20N.

Athy, Lawrence F., Jr., to Southwestern Manufacturing Co. Actuator control system. 4,036,106, Cl. 91-5.000.

Atkins, James Damon; Murphy, Charles Allen; and Stotts, Lewis Everett, to International Business Machines Corporation. Data processor using a four section instruction format for control of multi-operation functions by a single instruction. 4,037,213, Cl. 364-200.000.

Atkinson, Steven B.; and Reed, James E., to Atkinson, Steven B. Gear-shift position indicator. 4,037,196, Cl. 340-70.000.

Atlas Copco Aktiebolag: *See*—
Sjostrand, Fritiof Stig; Lundmark, Anders Gunnar Rudolf; and Ekstrom, Gosta Ivar, 4,036,085, Cl. 81-52.300.

Atomic Energy of Canada Limited: *See*—
Meadowcraft, Ronald Ross; and Bain, Alastair Stewart, 4,036,691, Cl. 176-68.000.

Auberger, Jacques: *See*—
Lucas, Roger; and Auberger, Jacques, 4,035,891, Cl. 29-159.010.

Aurich, Christoph W.; Sturkey, William Cleere; and Turner, James Keith, to Gaston County Dyeing Machine Company. Apparatus for low liquor ratio wet processing of textile fabric. 4,036,038, Cl. 68-5.00C.

Auto-Chlor System: *See—*
Robinson, James D., 4,036,404, Cl. 222-39.000.

Avar, Lajos; and Hofer, Kurt, to Sandoz Ltd. Method of stabilizing organic materials employing pyrazole nickel complexes. 4,036,812, Cl. 260-45.75N.

Avara, Teddy Walter. Excavator attachment for boom structure. 4,035,936, Cl. 37-116.000.

Avon Products, Inc.: *See—*
Karg, Gerhart; and Vaughan, Christopher D., 4,036,241, Cl. 132-7.000.

Avondale Shipyards, Inc.: *See—*
Constantine, Henry G., 4,036,107, Cl. 90-11.00C.

Axelsson, Lars Bengt: *See—*
Dahlkvist, Nils Goran; Axelsson, Lars Bengt; and Sander, Nils Borje Lennart, 4,036,111, Cl. 92-29.000.

Ayers, Joseph W. Zircon sand impacting material. 4,035,962, Cl. 51-308.000.

Ayerst McKenna and Harrison Ltd.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,036,856, Cl. 260-343.30R.

B. F. Goodrich Company, The: *See—*
Henning, Dale A.; and Rainbolt, Jack D., 4,036,330, Cl. 188-72.800.
Orndorff, Roy Lee, Jr., 4,036,472, Cl. 254-93.0HP.
Stricharczuk, Paul Thomas, 4,036,912, Cl. 260-897.00A.

B-Line Systems, Inc.: *See—*
Kowalski, Joseph W., 4,037,098, Cl. 240-78.00R.

Baab, Albert: *See—*
Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, 4,036,571, Cl. 425-556.00R.

Babcock & Wilcox Company, The: *See—*
Walton, Lewis Anthony, 4,036,692, Cl. 176-76.000.

Babinsky, Andrew D.; and Benezra, Leo L., to Diamond Shamrock Corporation. Method for concentration and purification of a cell liquor in an electrolytic cell. 4,036,717, Cl. 204-153.000.

Babinsky, Andrew D., to Diamond Shamrock Corporation. Converting a diaphragm electrolytic cell to a membrane electrolytic cell. 4,036,728, Cl. 204-283.000.

Bach, Donald John: *See—*
Guthrie, James Leverette; and Bach, Donald John, 4,036,791, Cl. 260-2.5AG.

Back, Sangho E.; and Reba, Imants, to Crown Zellerbach Corporation. Process for producing convoluted, fiberized, cellulose fibers and sheet products therefrom. 4,036,679, Cl. 162-9.000.

Baden, Harry C.; Bard, Charleton C.; and Brugger, Donald J., to Eastman Kodak Company. Method of recovering silver from photographic bleach-fix and concurrently regenerating the bleach-fix. 4,036,715, Cl. 204-109.000.

Badono, Shinji: *See—*
Oda, Minoru; and Badono, Shinji, 4,037,099, Cl. 250-272.000.

Baechle, William G.; and Roehm, Edward L. Furniture spring support. 4,036,526, Cl. 297-452.000.

Bagley, Charles Stuart. Method and apparatus for producing a directed, high-velocity stream of compressible fluid. 4,036,020, Cl. 60-644.000.

Bagli, Jehan F.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,036,856, Cl. 260-343.30R.

Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., to General Foods Corporation. Chewing gums of longer lasting sweetness and flavor. 4,036,992, Cl. 426-3.000.

Bailey, John M., to Caterpillar Tractor Co. Unit fuel injector. 4,036,195, Cl. 123-139.0AK.

Bailey, Ronald Barry; and Stitt, Thomas Detlor, to General Electric Company. Multiple frequency chopper control. 4,037,145, Cl. 318-341.000.

Bain, Alastair Stewart: *See—*
Meadowcraft, Ronald Ross; and Bain, Alastair Stewart, 4,036,691, Cl. 176-68.000.

Baines, Eric; Forshaw, Sydney James; and Harvey, Kenneth, to Colgate-Palmolive Company. Oral preparations. 4,036,950, Cl. 424-54.000.

Baird-Atomic, Inc.: *See—*
Westell, William E., 4,037,161, Cl. 328-133.000.

Bajorek, Jay E.; and Newman, Albert L., to Questor Corporation. Tubular spindle cover. 4,035,978, Cl. 52-727.000.

Baker, Dennis Stanley: *See—*
Patel, Padma Ambalal; and Baker, Dennis Stanley, 4,036,822, Cl. 260-79.000.

Baker, Don R., to Stauffer Chemical Company. Insecticidal and miticidal active isothiuronium tricyclohexyl tin imide. 4,036,958, Cl. 424-245.000.

Baker, Don R.: *See—*
Pallos, Ferenc M.; and Baker, Don R., 4,036,628, Cl. 71-86.000.

Baker, Robert A.: *See—*
Byrns, John, 4,036,616, Cl. 55-498.000.

Ball Corporation: *See—*
Miller, Edward C., 4,036,047, Cl. 72-347.000.

Ballas, George C.; and Geist, Thomas N., to Weed Eater, Inc. Rotary cutting assembly. 4,035,912, Cl. 30-276.000.

Balz, Gunther W., to Roto-Finish Company. Finishing apparatus having part-isolating means which confines or maintains contents in individual compartments and is carried along by said contents. 4,035,960, Cl. 51-163.100.

Balzers Patent und Beteiligungs AG: *See—*
Becker, Willi, 4,036,565, Cl. 417-420.000.

Bamberg, Walter H., to Cryogenic Technology, Inc. Lost-motion refrigeration drive system. 4,036,027, Cl. 62-6.000.

Barber-Colman Company: *See—*
Darsie, Burns; and Schewe, Richard A., 4,036,262, Cl. 139-11.000.

Barclay, Robert, Jr.: *See—*
Bertozzi, Eugene R.; Barclay, Robert, Jr.; Packer, David H.; and Smith, Daniel J., 4,036,882, Cl. 260-584.00B.

Bard, Charleton C.: *See—*
Baden, Harry C.; Bard, Charleton C.; and Brugger, Donald J., 4,036,715, Cl. 204-109.000.

Bardonnet, Claude; Brun, Robert; and Pages, Michel, to Rhone-Poulenc Industries. Fluid fractionating membrane apparatus. 4,036,760, Cl. 210-323.00R.

Barkley, John Allen; Robinson, Neil Lloyd; and Shelledy, Frank Boyd, to International Business Machines Corporation. Magnetic head housing with wedge locking means. 4,037,264, Cl. 360-129.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz, 4,035,879, Cl. 28-246.000.

Barnes, Gerald O.; and Horne, Charles E. Fuel dispensing arrangement. 4,036,403, Cl. 222-23.000.

Barnes, J. Haywood, to Oldham, Edwin W.; and Oldham, Vern L., part interest to each. Low friction meat extruder and cutter means therefor. 4,036,442, Cl. 241-82.500.

Barnes, Jack H. Food dehydrator and fan therefor. 4,036,562, Cl. 415-79.000.

Barr, Harold N.; Lyon, Warren Charles; and Bustard, Thomas S., to Nuclear Battery Corporation. Thermopile for microwatt thermoelectric generator. 4,036,665, Cl. 136-202.000.

Barth, Wayne E., to Pfizer Inc. 3-Hydroxy and 3-acetoxy-6-triphenylmethylaminopenams. 4,036,846, Cl. 260-306.70C.

Barton, Derek Harold Richard; and Hesse, Robert Henry, to Research Institute for Medicine and Chemistry Inc. Chemical process. 4,036,864, Cl. 260-397.300.

Baruffa, Olindo: *See—*
Fresard, Marcel; Baruffa, Olindo; and Gabriel, Jean-Pierre, 4,036,158, Cl. 112-258.000.

BASF Aktiengesellschaft: *See—*
Blechschmitt, Kurt; Reuter, Peter; Wirth, Friedrich; Buerger, Gert; and Seubert, Rolf, 4,036,783, Cl. 252-461.000.
Engelbach, Heinz; and Sprague, Michael Jolyon, 4,036,860, Cl. 260-369.000.
Hammon, Fritz; Schnell, Georg; and Reimer, Karl-Juergen, 4,037,259, Cl. 360-66.000.
Keppler, Hans Georg; Stahnecker, Erhard; and Moeller, Rolf, 4,036,794, Cl. 260-2.50B.
Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gonsior, Leonhard; and Gruber, Wolfgang, 4,037,042, Cl. 526-106.000.
Voges, Dieter; Winderl, Siegfried; and Mueller, Herbert, 4,036,883, Cl. 260-585.00B.
Wolf, Hans; Gerendas, Jozsef; and Wilhelm, Ernst, 4,036,587, Cl. 8-92.000.

Basten, Albert T.; and Dreissen, Hubert H., to Stamicarbon B.V. Process for recovering usable materials from waste material containing metals and non-metals. 4,036,441, Cl. 241-20.000.

Bauer, Carl F., to UOP Inc. Finned tube solar energy absorber. 4,036,208, Cl. 126-271.000.

Bauer, Franz: *See—*
Weimar, Peter; and Bauer, Franz, 4,036,601, Cl. 428-663.000.

Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, to Bayer Aktiengesellschaft. Ethyleneimine inactivated microorganisms. 4,036,952, Cl. 424-89.000.

Bauer, Paul T.: *See—*
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 4,036,519, Cl. 296-1.00S.

Baugh, Benton F., to Vetco Offshore Industries, Inc. Multi-pressure, single line supply system. 4,036,247, Cl. 137-236.000.

Baumgaertner, Heinrich, to Hochtemperatur-Reactorbau GmbH. Multichamber hydrogen generating plant heated by nuclear reactor cooling gas. 4,036,689, Cl. 176-39.000.

Bayer Aktiengesellschaft: *See—*
Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, 4,036,952, Cl. 424-89.000.
Boehmke, Gunther, 4,036,826, Cl. 260-205.000.
Enders, Edgar, 4,036,850, Cl. 260-309.500.
Hederich, Volker; Bien, Hans-Samuel; and Gehrke, Gunter, 4,036,862, Cl. 260-380.000.
Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl. 424-217.000.
Hoffmann, Hellmut; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,036,982, Cl. 424-285.000.
Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, 4,036,748, Cl. 210-23.00H.
Lohwasser, Hermann; Nogaj, Alfred; and Reinehr, Ulrich, 4,035,884, Cl. 28-281.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,966, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,967, Cl. 424-269.000.
Moritz, Karl-Ludwig, 4,036,824, Cl. 260-186.000.
Rademachers, Jacob; Erfurth, Henning; and Hund, Franz, 4,036,662, Cl. 106-300.000.
Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, 4,036,956, Cl. 424-210.000.

Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R.
Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.
Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 4,036,632, Cl. 71-93.000.
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,036,986, Cl. 424-322.000.

Baz, Amr M. S.: *See—*
Seireg, Ali A.; and Baz, Amr M. S., 4,037,084, Cl. 235-69.000.

BBC Brown Boveri & Company Limited: *See—*
Beriger, Conrad; and Muller, Reinhard, 4,037,045, Cl. 174-15.00R.

Beale, William T. Self-starting, free piston Stirling engine. 4,036,018, Cl. 60-520.000.

Bechtel, Pierre: *See—*
Dulou, Raymond; Magnin, Pierre; and Bechtel, Pierre, 4,036,884, Cl. 260-586.00G.

Beck, John W.: *See—*
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.

Becker, Dietmar; Jehle, Fritz; Schonthaler, Rubi; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Device for sewing together plies of material adjusted to equal lengths. 4,036,156, Cl. 112-121.260.

Becker, Otto Alfred. Resistance welding of sheet metal coated with layers. 4,037,073, Cl. 219-92.000.

Becker, Willi, to Balzers Patent und Beteiligungs AG. Pump construction. 4,036,565, Cl. 417-420.000.

Beckman Instruments, Inc.: *See—*
Durland, Douglas Howard; and McGilvray, Malcolm Canmore, Jr., 4,036,428, Cl. 233-23.00R.
Pierre, Kenneth Jonas; Tung, Ker-Kong; and Nadj, Henriette, 4,036,697, Cl. 195-99.000.

Beecham Group Limited: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,036,964, Cl. 424-258.000.
Ferres, Harry; and Clayton, John Peter, 4,036,829, Cl. 260-239.100.
Sharland, David Cedric, 4,036,968, Cl. 424-271.000.
Stirling, Irene, 4,036,969, Cl. 424-272.000.
Thorne, David Edward; and Engel, Kurt, 4,036,844, Cl. 260-295.00R.

Beers, Roger N.: *See—*
Conger, Marvin T.; and Beers, Roger N., 4,036,765, Cl. 252-21.000.

Beerwerth, Wolfgang: *See—*
Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang; and Messerschmidt, Jurgen, 4,036,485, Cl. 269-285.000.

Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, to Daimler-Benz Aktiengesellschaft. Clutch plate with multiple spring and friction dampers. 4,036,341, Cl. 192-106.200.

Begany, Albert J.: *See—*
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,036,837, Cl. 260-250.0BN.

Behn, Rudolf: *See—*
Hoppe, Lutz; and Behn, Rudolf, 4,036,821, Cl. 260-78.0SC.

Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., to Western Gear Corporation. Method and apparatus for determining the profile of an underwater pipeline. 4,037,189, Cl. 340-6.00R.

Bell & Howell Company: *See—*
Jamieson, John; Price, Henry F.; and Butts, William O., 4,037,239, Cl. 354-203.000.

Bell, Reuben H.: *See—*
Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., 4,036,806, Cl. 260-37.00N.

Bell, Rex D.; and Favor, Robert R., to Bowie Industries, Inc. Seed harvester. 4,035,993, Cl. 56-13.100.

Bell Telephone Laboratories, Incorporated: *See—*
Beuscher, Hugo Jacob, 4,037,091, Cl. 235-153.0AM.
Carbrey, Robert Lawrence, 4,037,117, Cl. 307-252.00N.
Coquin, Gerald Allan; Maldonado, Juan Ramon; Maydan, Dan; and Somekh, Sasson Roger, 4,037,111, Cl. 250-505.000.
Cordell, Robert Roger, 4,037,171, Cl. 331-14.000.
English, John Hershel; Griffiths, James Edward; and Zuk, Paul, 4,037,266, Cl. 361-120.000.
Feit, Eugene David; and Schwartz, Newton, 4,036,708, Cl. 204-38.00A.
Lee, Charles Meng-Yuan, 4,037,115, Cl. 307-214.000.
Lefkowitz, Michael; and Taylor, Michael Gordon, 4,037,050, Cl. 178-69.00G.

Bellasalma, Gerald John. Body member protective device. 4,036,220, Cl. 128-82.000.

Beloit Corporation: *See—*
Saltarelli, Martin O., 4,036,443, Cl. 241-297.000.
Schmitt, Arnold J.; and Linkletter, Merle G., 4,036,684, Cl. 162-290.000.

Belousov, Vladimir Petrovich: *See—*
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.

Benasutti, Louis D.; and Sucro, Jost S., to General Motors Corporation. Water chilling tank for refrigerator. 4,036,620, Cl. 62-338.000.

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Civolani, Bruno; and Benelli, Paolo, 4,035,943, Cl. 42-69.00B.

Benezra, Leo L.: *See—*
Babinsky, Andrew D.; and Benezra, Leo L., 4,036,717, Cl. 204-153.000.

Bennett, Bobby B.: *See—*
Hopkins, Jeffrey E.; and Bennett, Bobby B., 4,036,463, Cl. 248-210.000.

Bennett, Milton, to Philstone Nail Corporation. Blind rivet assembling. 4,035,898, Cl. 29-788.000.

Bennett, Robert James; and Grischkowsky, Daniel Richard, to International Business Machines Corporation. Laser modulator for producing dark-pulses. 4,036,554, Cl. 350-160.00R.

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Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., to Motorola, Inc. Microprocessor interrupt logic. 4,037,204, Cl. 364-200.000.

Bentley Engineering Company, Ltd., The: *See—*
Jesson, Leslie William Digby, 4,036,033, Cl. 66-14.000.

Berger, Frank M.: *See—*
Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000.

Bergvik och Ala Aktiebolag: *See—*
Hedman, Bengt, 4,036,010, Cl. 59-84.000.

Bergwerksverband GmbH: *See—*
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, 4,036,024, Cl. 61-42.000.

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Berkley & Company, Inc.: *See—*
Oberg, Gary R., 4,035,856, Cl. 9-313.000.

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Berol Kemi AB: *See—*
Brostrom, Anders, 4,036,875, Cl. 260-505.00S.

Berry, R. Arlen; and Thompson, Albert W., to Loews Theatres, Inc. Apparatus for opening cigarette cartons and packs and removing the cigarettes. 4,036,380, Cl. 214-305.000.

Bertolini, Guglielmo: *See—*
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,037,041, Cl. 526-97.000.

Bertozzi, Eugene R.; Barclay, Robert, Jr.; Packer, David H.; and Smith, Daniel J., to Thiokol Corporation. Amine formal polymers and process of making the same. 4,036,882, Cl. 260-584.00B.

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Besser Company: *See—*
Cruzen, Harry F.; and Gresham, Robert W., 4,036,570, Cl. 425-141.000.

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Bethea, Sam R.: *See—*
Manne, Richard S.; Bethea, Sam R.; and Kelso, Edward A., 4,036,734, Cl. 208-57.000.

Bethlehem Steel Corporation: *See—*
Foulds, John G., 4,037,087, Cl. 235-151.100.

Betts, Colin; Collinson, Alfred Edward; and Hart, David Frederick, to United Kingdom Atomic Energy Authority. Nuclear reactor fuel element assemblies. 4,036,690, Cl. 176-40.000.

Betts, Robert E.; Thorn, Lawrence B.; and Maykut, Albert R., to United States of America, Army. Noise controllable nozzle closure. 4,036,013, Cl. 60-271.000.

Betts, William L.; and Greene, Robert T., to NCR Corporation. Pulse code modulation compressor. 4,037,226, Cl. 340-347.0DD.

Betzmeir, Helmut; and Lettau, Hans, to Siemens Aktiengesellschaft. Method and apparatus for detecting the leak of coolant into the jacket of a nuclear reactor fuel rod. 4,036,685, Cl. 176-19.0LD.

Beukes, Quintin John: *See—*
Brink, Andries; Kleynjan, Cornelis; and Beukes, Quintin John, 4,036,730, Cl. 208-8.000.

Beuscher, Hugo Jacob, to Bell Telephone Laboratories, Incorporated. Error correction circuit utilizing multiple parity bits. 4,037,091, Cl. 235-153.0AM.

Beyersdorf, Hartwig. Circuit arrangement for monitoring interruptions in two closed-circuit loops. 4,037,220, Cl. 340-256.000.

Beyleveld, Wilhelmus M.: *See—*
Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., 4,036,898, Cl. 260-649.00R.

Bezdek, Milan: *See—*
Hrabak, Frantisek; Hynkova, Vlasta; and Bezdek, Milan, 4,036,909, Cl. 260-874.000.

Bianchi, John E.; and Nichols, Richard D. E., to Bianchi Leather Products. Method of manufacturing holster. 4,035,902, Cl. 29-446.000.

Bianchi Leather Products: *See—*
Bianchi, John E.; and Nichols, Richard D. E., 4,035,902, Cl. 29-446.000.

Bic Pen Corporation: *See—*
Marynissen, William E., 4,036,579, Cl. 431-131.000.

Biedermann, Wolfgang: *See—*
Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.

Bien, Hans-Samuel: *See—*
Hederich, Volker; Bien, Hans-Samuel; and Gehrke, Gunter, 4,036,862, Cl. 260-380.000.

Bieri, Karl, to Hagezet-Aktiengesellschaft. Brewing apparatus for beverage-brewing machine. 4,036,121, Cl. 99-289.00R.

Bierlich, Johannes Harald. Hinge and hinge and pivot arrangement. 4,035,953, Cl. 49-192.000.

Bigatti, Ettore: *See—*
Loken, Bjarte; MacDonald, Peter Lindsay; and Bigatti, Ettore, 4,036,831, Cl. 260-239.55D.

Bigliani, Umberto; and Jacoel, Rafael, to Fiat Societa per Azioni. Device for automatic control of electronic spark ignition advance for internal combustion engines. 4,036,190, Cl. 123-117.00D.

Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, to Dragerwerk Aktiengesellschaft. Device for the continuous determination of carbon monoxide content of air. 4,036,724, Cl. 204-195.00R.

Bindra, Jasjit S.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832, Cl. 260-240.00R.

Binsack, Rudolf: *See—*
Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, 4,036,748, Cl. 210-23.00H.

Biological Developments, Inc.: *See—*
Soares, James R., 4,036,823, Cl. 260-112.00R.

Biondetti, Mario, to Escher Wyss G.m.b.H. Web press for a paper machine. 4,036,683, Cl. 162-274.000.

Birney, Richard Eugene; Osborne, William Steese; and Graybiel, Lynn Allan, to International Business Machines Corporation. System for controlling address keys under interrupt conditions. 4,037,207, Cl. 364-200.000.

Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, to International Business Machines Corporation. Key register controlled accessing system. 4,037,214, Cl. 364-200.000.

Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, to International Business Machines Corporation. Key controlled address relocation translation system. 4,037,215, Cl. 364-200.000.

Birum, Gail H., to Monsanto Company. Phosphorus compounds. 4,036,913, Cl. 260-938.000.

Blackaby, Benjamin E., to Teledyne Industries, Inc. Apparatus for balancing rotating bodies. 4,037,076, Cl. 219-121.00L.

Blackmon, Jimmy D.: *See—*
Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., 4,036,450, Cl. 242-129.000.

Blanc, Jean-Henri; Pornin, Rene; and Voirin, Robert, to Societe Nationale Elf Aquitaine (Production). Hydrophilic modified acrylic polymers particularly hydrodispersible or hydrosoluble modified acrylic polymers and method of preparing the same. 4,037,035, Cl. 526-16.000.

Blanpied, Robert Howard: *See—*
Roberts, Frank William; Roberts, Richard Allen; Roberts, Waldo Calvin; and Blanpied, Robert Howard, 4,037,006, Cl. 428-71.000.

Blau KG Fabrik fur Kraftfahrzeugteile: *See—*
Gerdes, Theodor, 4,036,399, Cl. 220-303.000.

Blawn, James F.: *See—*
Blawn, Thomas A.; and Blawn, James F., 4,036,495, Cl. 273-43.00R.

Blawn, Thomas A.; and Blawn, James F. Time delay mechanism for automatic pinsetting machine. 4,036,495, Cl. 273-43.00R.

Blechschmitt, Kurt; Reuter, Peter; Wirth, Friedrich; Buerger, Gert; and Seubert, Rolf, to BASF Aktiengesellschaft. Supported catalyst containing vanadium and titanium. 4,036,783, Cl. 252-461.000.

Blidung, Otto: *See—*
Schubert, Bernhard; and Blidung, Otto, 4,036,119, Cl. 93-77.0FT.

Blize, Roy L.: *See—*
Dean, Michael F.; and Blize, Roy L., 4,036,602, Cl. 428-621.000.

Blount, David H. Process for the production of epoxy silicate compounds and polymers. 4,036,787, Cl. 260-2.00S.

Blume, Edith Inge, heir: *See—*
Blume, Friedrich, deceased; Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.

Blume, Friedrich, deceased (by Blume, Edith Inge, heir); Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, to Braun Aktiengesellschaft. Shear foil for a dry shaver. 4,035,914, Cl. 30-346.510.

Blume, Friedrich, heir: *See—*
Blume, Friedrich, deceased; Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.

Blume, Monika Ingrid, heir: *See—*
Blume, Friedrich, decease- Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messi-ger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.

Blytas, George C., to Shell Oil Company. Hydrogen sorbent composition and its use. 4,036,944, Cl. 423-648.00R.

Bodker, John R., to Qualitrol Corporation. Hot spot thermometer. 4,036,058, Cl. 73-350.000.

Bodley, Robert W.; and Ulm, Reign C., to Aerojet-General Corporation. Floating roof for liquid storage tanks. 4,036,394, Cl. 220-222.000.

Bodnar, Ernest Robert. Anti-backlash gear system. 4,036,074, Cl. 74-409.000.

Bodor, Nicolae S.; and Sloan, Kenneth B., to Interx Research Corporation. Novel transient acyl derivatives of phenylbutazone. 4,036,845, Cl. 260-295.00L.

Bodor, Nicolae S.: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 4,036,843, Cl. 260-294.80R.

Bodson, Guy: *See—*
Weilbacher, Jean-Claude; and Bodson, Guy, 4,036,686, Cl. 176-19.00R.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Cationic azo dyestuffs with a hydroxyalkylated ammonium group. 4,036,826, Cl. 260-205.000.

Boehringer Ingelheim G.m.b.H.: *See—*
Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, 4,036,988, Cl. 424-330.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 4,036,972, Cl. 424-273.000.

Boeing Company, The: *See—*
Hanson, Carl V.; and Whitener, Philip C., 4,036,257, Cl. 137-614.060.
Schairer, George S., 4,036,452, Cl. 244-1.00N.
Whitener, Philip C., 4,036,455, Cl. 244-118.00R.

Boesten, Wilhelmus H. J., to Stamicarbon B.V. Optical resolution of phenyl-glycine amide. 4,036,852, Cl. 260-326.450.

Boffa, Gioacchino: *See—*
Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, 4,036,733, Cl. 208-12.000.

Boggs, Roger L.: *See—*
Haslett, Glen M.; and Boggs, Roger L., 4,036,538, Cl. 305-47.000.

Bogri, Tibor: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,036,856, Cl. 260-343.30R.

Bohmer, Eberhard; and Husch, Wilhelm, to Klockner-Werke AG. Blast-furnace lining arrangement. 4,036,483, Cl. 266-281.000.

Boitsov, Alexandr Ivanovich: *See—*
Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich; Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich, 4,036,425, Cl. 233-2.000.

Bolth, Franklin Anderson: *See—*
Strow, Lawrence Evans; and Bolth, Franklin Anderson, 4,036,746, Cl. 209-166.000.

Bond, Norman John, to Fiber Industries, Inc. Multipurpose intermingling jet and process. 4,035,883, Cl. 28-220.000.

Bonner, Gilbert Belmont; and Dessel, Joseph Leo, to International Business Machines Corporation. Linear actuator. 4,037,122, Cl. 310-14.000.

Booth, Eugene E.: *See—*
Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,036,478, Cl. 266-133.000.

Boots Company Limited, The: *See—*
Armitage, Bernard J.; and Nicholson, John S., 4,036,989, Cl. 424-353.000.

Borden, Inc.: *See—*
Chan, Lock-Lim; and Guitard, Arthur Herbert, 4,036,682, Cl. 162-167.000.

Bordet, Philippe: *See—*
Le Mehaute, Alain; and Bordet, Philippe, 4,037,028, Cl. 429-104.000.

Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, to Commissariat a l'Energie Atomique. Method of controlling an optical characteristic. 4,036,553, Cl. 350-160.0LC.

Borg-Warner Corporation: *See—*
Durum, Metin Mustafa, 4,036,032, Cl. 64-21.000.

Borgman, Milton H.: *See—*
Hills, William H.; and Borgman, Milton H., 4,035,880, Cl. 28-220.000.

Boring, John W.: *See—*
Hoyle, John A.; Humphris, Robert R.; and Boring, John W., 4,037,102, Cl. 250-336.000.

Borsh, Richard J.: *See—*
Pate, Harold T.; and Borsh, Richard J., 4,036,389, Cl. 220-3.800.

Borsotti, Giampiero: *See—*
Ribaldone, Giuseppe; and Borsotti, Giampiero, 4,036,859, Cl. 260-364.000.

Borzym, Alexander, to Alpha Industries, Inc. Universal double cut die set. 4,036,091, Cl. 83-319.000.

Boschert Associates: *See—*
Keller, Richard A., 4,037,271, Cl. 363-21.000.

Bottenbruch, Ludwig: *See—*
Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, 4,036,748, Cl. 210-23.00H.

Bouman, Willem John: *See—*
Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, 4,036,415, Cl. 223-40.000.

Bouse, Clyde W., to General Energy Devices. Water heating assembly. 4,036,207, Cl. 126-271.000.

Bowie Industries, Inc.: *See—*
Bell, Rex D.; and Favor, Robert R., 4,035,993, Cl. 56-13.100.

Boyden, Willis G.; and Shaw, Richard A. Current sensing alarm circuit for a motor vehicle. 4,037,194, Cl. 340-63.000.

Boyer, William M.: *See—*
Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., 4,037,011, Cl. 428-294.000.

Boyko, Daniel; Wallach, David; and Gasul, Mordecai. Insert installing machine. 4,035,900, Cl. 29-795.000.

Boyles, Bruce K.; and Crow, John L., Jr., to American Cyanamid Company. Preparation of ferric sulfate solutions. 4,036,941, Cl. 423-558.000.

Braas & Co. GmbH: *See—*
Mombaecher, Ingolf, 4,036,405, Cl. 222-63.000.
Mombaecher, Ingolf, 4,036,410, Cl. 222-255.000.

Braiko, Voldmir Vasilievich: *See—*
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.

Brake Engineering, Inc.: *See—*
Hoffman, Neil R.; and Jansen, Johannes H., 4,036,328, Cl. 188-26.000.

Brandon, William D., to Caterpillar Tractor Co. Bonding fluoroelastomers to metal. 4,036,668, Cl. 148-6.350.

Branick, Charles Earl. Tire stripping apparatus. 4,036,275, Cl. 157-13.000.

Brantner, Bernard H. Louvered window lock. 4,035,952, Cl. 49-74.000.

Bratton, David: *See—*
Kocsis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David; and Pickard, John, 4,036,133, Cl. 101-415.100.

Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., to Hughes Aircraft Company. Package for making photopolymerized plates. 4,036,647, Cl. 96-76.00C.

Braun Aktiengesellschaft: *See—*
Blume, Friedrich, deceased; Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.

Braun, Hans, to L. Schuler GmbH. Apparatus for cutting strip material into lengths and for stacking the cut lengths of strip material. 4,036,087, Cl. 83-79.000.

Braun, Johannes; and Sturm, Winfried, to Alcan Research and Development Limited. Aseptic packaging. 4,035,981, Cl. 53-21.00R.

Breazu, Stefan: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.

Breda Termomeccanica S.P.A.: *See—*
Soligno, Vincenzo, 4,036,461, Cl. 248-68.00R.

Breedis, John F.: *See—*
Watson, W. Gary; and Breedis, John F., 4,036,642, Cl. 75-164.000.

Brehm, Ronald Carl: *See—*
Over, William Roderick; and Brehm, Ronald Carl, 4,035,897, Cl. 29-56.600.

Breitenstein, Charles T.; and Nicolaus, Frank G., to Spiral Step Tool Company. Hopper payout for various coin denominations. 4,036,242, Cl. 133-4.00R.

Brendgord, Thomas; and Fisher, Kenneth J., to American Sterilizer Company. Illuminator apparatus using optical reflective methods. 4,037,096, Cl. 240-1.400.

Brennan, Martin David: *See—*
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.

Brennan, Michael E.; and Yeakey, Ernest L., to Texaco Development Corporation. Preparation of polyalkylene polyamines. 4,036,881, Cl. 260-583.00P.

Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., to General Electric Company. Tieless bracing for supporting end turns of a dynamoelectric machine. 4,037,126, Cl. 310-260.000.

Breslow, Jeffrey D., to Marvin Glass & Associates. Game apparatus. 4,036,492, Cl. 273-1.00R.

Breslow, Jeffrey D., to Marvin Glass & Associates. Game apparatus. 4,036,493, Cl. 273-1.00M.

Brewton, Lee K.: *See—*
Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., 4,036,450, Cl. 242-129.000.

Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, to Thomson-Brandt. Data carrier optically read out by transmission, and method of manufacturing said data carrier. 4,037,251, Cl. 358-128.000.

Bright, James A., to General Motors Corporation. Refuse compactor-incinerator disposer. 4,036,152, Cl. 110-8.00E.

Bright, Kenneth G., to Westbrook, Robert L.; and Westbrook, Henry, III, part interest to each. Log peeling machine. 4,036,270, Cl. 144-208.00E.

Briley, Ronald D.; and Pedersen, Vernon G., to Dacor Corporation. Divers buoyancy vest. 4,035,857, Cl. 9-342.000.

Brink, Andries; Kleynjan, Cornelis; and Beukes, Quintin John, to South African Coal, Oil & Gas Corporation Limited. Solvent-refining of coal. 4,036,730, Cl. 208-8.000.

British Cast Iron Research Association: *See—*
Evans, Edward Raymond; and Dawson, John Victor, 4,036,641, Cl. 75-130.00A.

British Petroleum Company Limited, The: *See—*
Gregory, Reginald, 4,036,902, Cl. 260-673.000.
Westermann, Peter Henry, 4,036,799, Cl. 260-28.50B.

Broken Hill Proprietary Company Limited, The: *See—*
Howells, Edward Morris; and Chan, Cheung Yun, 4,037,095, Cl. 235-183.000.

Brook, Greville B.; Brooks, Peter L.; and Iles, Roger F., to Raychem Corporation. Mechanical preconditioning method. 4,036,669, Cl. 148-11.50C.

Brooks, Peter L.: *See—*
Brook, Greville B.; Brooks, Peter L.; and Iles, Roger F., 4,036,669, Cl. 148-11.50C.

Brostrom, Anders, to Berol Kemi AB. Process for the continuous sulphonation of alkyl aromatic hydrocarbons. 4,036,875, Cl. 260-505.00S.

Broughton, Donald B., to UOP Inc. Process for separating normal and isoparaffins. 4,036,745, Cl. 208-310.00Z.

Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, to National Research Development Corporation. Detection of carbon monoxide. 4,036,592, Cl. 23-232.00E.

Brown, Francis Barton: *See—*
Erickson, John W; Budrys, Vitolis; and Brown, Francis Barton, 4,036,427, Cl. 233-10.000.

Brown, George E.; and Farkas, Daniel F., to United States of America, Agriculture. System for treating particulate material with gaseous media. 4,035,925, Cl. 34-8.000.

Brown, Michael Trevenen; and Rodway, William George, to Imperial Chemical Industries Limited. Process for preparing a friable tetrafluoroethylene polymer powder from unsintered coagulated dispersion grade tetrafluoroethylene polymer. 4,036,718, Cl. 204-159.200.

Brown, Patrick M., to Foote Mineral Company. Process for the production of high purity lithium hydroxide. 4,036,713, Cl. 204-98.000.

Brown, Peter William, to Girling Limited. Braking member having a plurality of coating fins. 4,036,334, Cl. 188-264.00A.

Brown, Thomas A.: *See—*
Huber, Joseph B.; and Brown, Thomas A., 4,036,095, Cl. 83-674.000.

Brown, William E.; and Smith, Clyde M., to Woods Metal Company, Inc. Rotary sweep arm for self-cleaning filter apparatus. 4,036,613, Cl. 55-294.000.

Brown & Williamson Tobacco Corporation: *See—*
Luke, John Anthony, 4,036,114, Cl. 93-1.00C.

Brownson, Eric J.: *See—*
Brownson, Ivan F.; and Brownson, Eric J., 4,035,877, Cl. 24-230.0SL.

Brownson, Ivan F.; and Brownson, Eric J. Buckle. 4,035,877, Cl. 24-230.0SL.

Broyles, Douglas Wright; and Stark, Troy Cecil, to Singer Company, The. Variable clock rate resonant printer with nonlinear correction. 4,037,231, Cl. 346-108.000.

Bruckenstein, Stanley: *See—*
Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,036,726, Cl. 204-231.000.

Brugger, Donald J.: *See—*
Baden, Harry C.; Bard, Charleton C.; and Brugger, Donald J., 4,036,715, Cl. 204-109.000.

Brumagim, Ivan S. Method and process for treating rumen content. 4,037,002, Cl. 426-641.000.

Brun, Robert: *See—*
Bardonnet, Claude; Brun, Robert; and Pages, Michel, 4,036,760, Cl. 210-323.00R.

Brushwyler, Gordon R.; and Scott, Timothy F., to Robertshaw Controls Company. Flow through cell assembly. 4,036,722, Cl. 204-195.00B.

Bruzzone, Mario: *See—*
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,037,041, Cl. 526-97.000.

Bublitz, Arthur T.; and Holben, Eugene F., to Reliance Electric Company. Adjustable valve assembly. 4,036,256, Cl. 137-595.000.

Bucalo, Louis. Fluid-collecting and microorganism-detecting devices. 4,036,214, Cl. 128-2.00F.

Bucco, Mario P.; and Van Valkenburg, Alvin, to Mearl Corporation, The. Foamed mastic composition, building articles coated therewith, and method of preparing same. 4,036,656, Cl. 106-88.000.

Buchel, Karl Heinz: *See—*
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,966, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,967, Cl. 424-269.000.

Buckbee-Mears Company: *See—*
Crask, Roy I.; and Egerer, William D., 4,037,139, Cl. 361-58.000.

Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, to Beecham Group Limited. Isocarbostyril-3-carboxylic acid derivatives for the prophylaxis of asthma, hayfever and rhinitis. 4,036,964, Cl. 424-258.000.

Budapesti Muszaki Egyetem: *See—*
Petro, Jozsef; Mathe, Tibor; and Tungler, Antal, 4,036,877, Cl. 260-515.00R.

Budrys, Vitolis: *See—*
Erickson, John W; Budrys, Vitolis; and Brown, Francis Barton, 4,036,427, Cl. 233-10.000.

Buerger, Gert: *See—*
Blechschmitt, Kurt; Reuter, Peter; Wirth, Friedrich; Buerger, Gert; and Seubert, Rolf, 4,036,783, Cl. 252-461.000.

Buford, Wesley E.: *See—*
Douce, Donald R.; and Buford, Wesley E., 4,036,476, Cl. 254-172.000.

Bumgardner, Jon H., to United States of America, Navy. Pseudo sampling. 4,037,162, Cl. 328-151.000.

Bunda, Tsuchio: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,036,180, Cl. 123-3.000.

Bunker Ramo Corporation: *See—*
Keglewitsch, Josef, 4,036,544, Cl. 339-91.00R.
Nijman, John Peter, 4,036,547, Cl. 339-99.00R.
Resch, Alois Ruppert, 4,035,896, Cl. 29-753.000.

Burge, David A. Toy construction set having interconnectible components with interfitting formations. 4,035,947, Cl. 46-25.000.

Burge, Malcolm Leonard Ernest; and Gill, Heather Ann, to Tate & Lyle Limited. Icing mixture. 4,037,000, Cl. 426-572.00J.

Burger, Charles H. Interchangeable lane bowling calculator. 4,035,931, Cl. 35-29.00F.

Burlington Industries, Inc.: *See*—
Rosenfeld, Howard, 4,036,365, Cl. 209-73.000.

Burnett Company, Ltd., The: *See*—
Burnett, Ralph G., 4,036,101, Cl. 87-8.000.

Burnett, David. Boom gate. 4,035,955, Cl. 49-280.000.

Burnett, Gary L.; and Tsuda, George I., to Hughes Aircraft Company. Microwave tuning device. 4,037,182, Cl. 333-73.00R.

Burnett, Ralph G., to Burnett Company, Ltd., The. Double hollow braided rope assembly and method. 4,036,101, Cl. 87-8.000.

Burroughs Corporation: *See*—
Essenmacher, Albert M.; Krause, Thomas R.; and Dishaw, James, 4,037,198, Cl. 340-146.3ED.
Sharp, Richard Stanton, 4,037,210, Cl. 364-900.000.

Burroughs Wellcome Co.: *See*—
Stuart, Alexander, 4,036,961, Cl. 424-251.000.

Burson, Bob O., to R. E. Phelon Company, Inc. Single core condenser discharge ignition system. 4,036,201, Cl. 123-148.0CC.

Burtenshaw, Raymond Alfred Frank, to Colt International Limited. Ventilators. 4,036,120, Cl. 98-43.00R.

Burtley, Oscar L. Wheeled suitcase convertible to luggage cart. 4,036,336, Cl. 190-18.00A.

Burton, Paul F., to Dixie-Narco, Inc. Beverage dispensers. 4,036,621, Cl. 62-394.000.

Bury, Allen J.: *See*—
Mysiak, Eugene J.; and Bury, Allen J., 4,036,545, Cl. 339-95.00D.

Busby, Edwin S., Jr.; and Oldershaw, Reginald W., to Ampex Corporation. Tape timer error corrector circuit for tape recorder/reproducers. 4,037,260, Cl. 360-73.000.

Bush, John H.; and Lemonnier, Jean, to Millipore Corporation. Method and apparatus for membrane filter sterility testing. 4,036,698, Cl. 195-103.50M.

Bushey, Bransby W.: *See*—
Korr, Abraham L.; Walker, Evan Harris; Dickey, Charles M.; and Bushey, Bransby W., 4,036,140, Cl. 102-38.000.

Bustard, Thomas S.: *See*—
Barr, Harold N.; Lyon, Warren Charles; and Bustard, Thomas S., 4,036,665, Cl. 136-202.000.

Butts, William O.: *See*—
Jamieson, John; Price, Henry F.; and Butts, William O., 4,037,239, Cl. 354-203.000.

BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H.: *See*—
Manthey, Willi; and Deiwick, Horst, 4,036,243, Cl. 134-76.000.

Byrns, John, to Baker, Robert A., a part interest. Bacteria filter and method of assembling same. 4,036,616, Cl. 55-498.000.

C & H Manufacturing Company: *See*—
Molpus, Homer B., 4,036,486, Cl. 269-303.000.

C & P Industries, Inc.: *See*—
Perry, Eric; Heath, Roy T.; Rost, Lee F.; and Cowan, Braughler, 4,036,382, Cl. 214-313.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary, 4,036,303, Cl. 172-49.000.

Calgon Corporation: *See*—
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,036,660, Cl. 106-90.000.

California Institute of Technology: *See*—
Rembaum, Alan; and Yen, Shiao-Ping Siao, 4,036,808, Cl. 260-42.510.

Calspan Corporation: *See*—
Walker, John E., 4,037,048, Cl. 358-113.000.

Calver, Leonard H.: *See*—
Davies, Robert W.; Thornton, Leonard; Veness, Maxwell F.; and Calver, Leonard H., 4,036,117, Cl. 93-51.00R.

Cambridge Filter Corporation: *See*—
Goulet, Roger T., 4,036,054, Cl. 73-212.000.

Campbell, Eugene, to United States of America, Interior. Electro-optical speed transducer. 4,037,157, Cl. 324-175.000.

Campbell, Roy L.; and Loveland, Steven. Double lumened catheter. 4,036,210, Cl. 128-2.00F.

Camps, Jean Bernard, to Perticamps S.A.Embalagens. Container closure construction. 4,036,413, Cl. 222-500.000.

Canadian Industries, Ltd.: *See*—
Holton, Harry Hutchinson; and Segall, Gordon Hart, 4,036,680, Cl. 162-65.000.
Holton, Harry Hutchinson, 4,036,681, Cl. 162-65.000.

Canon Kabushiki Kaisha: *See*—
Aoki, Kanemasa, 4,037,125, Cl. 310-248.000.
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased, 4,036,650, Cl. 96-114.100.
Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233, Cl. 354-23.00D.
Tunekawa, Tokuichi; Nakamoto, Soichi; and Taguchi, Tetsuya, 4,037,234, Cl. 354-24.000.

Canon Seiki Kabushiki Kaisha: *See*—
Aoki, Kanemasa, 4,037,125, Cl. 310-248.000.

Cantalupi, Lewis: *See*—
Tucci, Domenick; and Cantalupi, Lewis, 4,037,223, Cl. 340-280.000.

Cantello, Barrie Christian Charles: *See*—
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,036,964, Cl. 424-258.000.

Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Peak shut-off electronic switch. 4,037,117, Cl. 307-252.00N.

Carey, Charles Henry; and Haury, Donald Richard, to Wean United, Inc. Apparatus for forming spooled and spool-less bundles of wire and the like. 4,036,448, Cl. 242-81.000.

Caribonum Limited: *See*—
Tilson, Edward Arthur; and Mayhew, Raymond Leonard, 4,037,012, Cl. 428-304.000.

Carisbrook Industries Inc.: *See*—
Hills, William H.; and Borgman, Milton H., 4,035,880, Cl. 28-220.000.

Carl Zeiss-Stiftung: *See*—
Troetscher, Otto; Wiedmann, Erwin; Stahl, Horst; and Forberich, Helmut, 4,036,762, Cl. 250-199.000.

Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, to Montedison Fibre S.p.A. Fluorescent benzanthronic dyes. 4,036,733, Cl. 208-12.000.

Carlow, Earl F.: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.

Carlson, Douglas M.: *See*—
Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.

Carpenter Technology Corporation: *See*—
Philip, Thoni V.; and Maniar, Gunvant N., 4,036,640, Cl. 75-126.00C.

Carre, Bernard: *See*—
Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.

Carroll, Thomas D.; and Cross, Christopher G., to PPG Industries, Inc. Method and apparatus for forming glass strand. 4,036,622, Cl. 65-3.00R.

Carstensen, Kenneth J.: *See*—
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,036,261, Cl. 138-96.00T.

Carter, Daniel Dulaney: *See*—
Nishioka, Masato; and Carter, Daniel Dulaney, 4,036,386, Cl. 215-260.000.

Casagrande, Bruno. Telescopic columns of machines for making foundations, and the telescopic columns thereby derived. 4,035,969, Cl. 52-111.000.

Caspar, Raymond; and Mathis, Paul-Henri. Demountable building. 4,035,968, Cl. 52-63.000.

Castellion, George Augustus; and Marzluff, William Frank, to American Cyanamid Company. Ammoxidation of alkanes. 4,036,870, Cl. 260-465.300.

Castone Development Corporation: *See*—
Prince, Douglas F., 4,036,575, Cl. 425-443.000.

Caterpillar Tractor Co.: *See*—
Bailey, John M., 4,036,195, Cl. 123-139.0AK.
Brandon, William D., 4,036,668, Cl. 148-6.350.
Godfrey, William H.; and Woessner, Neal L., 4,036,379, Cl. 214-152.000.
Habiger, Cyril W., 4,036,321, Cl. 180-6.480.
Haslett, Glen M.; and Boggs, Roger L., 4,036,538, Cl. 305-47.000.
Nieman, John R., 4,036,279, Cl. 164-57.000.

Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, to May & Baker Limited. Cyclopentane derivatives. 4,036,872, Cl. 260-468.00D.

Celanese Corporation: *See*—
Lowder, F. Ray; and Gibbon, John D., 4,036,003, Cl. 57-140.00R.
Trapasso, Louis E.; and Juelke, Charles V., 4,037,040, Cl. 526-88.000.

Celotex Corporation, The: *See*—
Moss, Ernest K., 4,036,793, Cl. 260-2.50F.

Centre Technique des Industries de la Fonderie: *See*—
Chaze, Louis G., 4,036,479, Cl. 266-195.000.

Centro Sperimentale Metallurgico S.p.A.: *See*—
Ramacciotti, Aldo, 4,036,278, Cl. 164-52.000.

Cerberus AG: *See*—
Scheidweiler, Andreas; and Meier, Otto, 4,037,106, Cl. 250-381.000.

Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, to Snam Progetti, S.p.A. Process for the polymerization of alpha-olefins, catalyst employed in such a process and method for the preparation thereof. 4,037,041, Cl. 526-97.000.

Ceskoslovenska akademie ved: *See*—
Hrabak, Frantisek; Hynkova, Vlasta; and Bezdek, Milan, 4,036,909, Cl. 260-874.000.

Cha, Chang Yul; and Ridley, Richard D., to Occidental Oil Shale, Inc. Enriching off gas from oil shale retort. 4,036,299, Cl. 166-261.000.

Chadbourne, William H.: *See*—
Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., 4,037,011, Cl. 428-294.000.

Chamberlain Manufacturing Corporation: *See*—
Willmott, Colin Barns, 4,037,201, Cl. 340-167.00R.

Chamran, Morteza M.; and Nemec, Allen R., to Perkin-Elmer Corporation, The. Circuit for calibrating instruments. 4,037,154, Cl. 324-123.00R.

Chan, Cheung Yun: *See*—
Howells, Edward Morris; and Chan, Cheung Yun, 4,037,095, Cl. 235-183.000.

Chan, David Cheong King, to Chevron Research Company. 1,3-Benzoxazin-4-one derivatives and their use as ovicides. 4,036,960, Cl. 424-248.500.

Chan, Lock-Lim; and Guitard, Arthur Herbert, to Borden, Inc. Paper

with synergistic dry strength additives and process therefor. 4,036,682, Cl. 162-167.000.
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for the production of an improved simulated casein from proteinaceous mixtures. 4,036,996, Cl. 426-254.000.
Chandramouli, Pitchaiya: *See*—
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,036,816, Cl. 260-59.00R.
Chang, Kuo Yuan, to Dow Chemical Company, The. Method for preparing coumarin. 4,036,854, Cl. 260-343.20R.
Chang, Long Fei, to Owens-Illinois, Inc. Method for blow molding a container having a concave bottom. 4,036,926, Cl. 264-94.000.
Chang, Louis H.; and Fravel, John C., to Xerox Corporation. Position retry apparatus for serial printer. 4,037,216, Cl. 364-900.000.
Chant, Bernard J.: *See*—
van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., 4,036,774, Cl. 252-132.000.
Chapman, Clyde H. Elastic band type toy cannon. 4,036,203, Cl. 124-21.000.
Chari, Srinivasan V., to Xerox Corporation. Data clock separator with missing clock detect. 4,037,257, Cl. 360-51.000.
Chari, Srinivasan V., to Xerox Corporation. Read/write apparatus for magnetic recorders. 4,037,258, Cl. 360-63.000.
Chateau, Louis Jean, to Ducellier & Cie. Device for protecting an ignition device for motor vehicles. 4,036,199, Cl. 123-148.00E.
Chaze, Louis G., to Centre Technique des Industries de la Fonderie. Cupola furnace. 4,036,479, Cl. 266-195.000.
Cheatham, Joseph F., to SW (Delaware), Inc. Apparatus for smoothing the surfaces of moving webs. 4,035,878, Cl. 26-87.000.
Chedid, Louis: *See*—
Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000.
Chemetron Corporation: *See*—
Sieradzki, Benjamin; and Giese, John David, 4,036,477, Cl. 259-41.000.
Chemische Fabrik Kalk GmbH: *See*—
Jenkner, Herbert, 4,036,894, Cl. 260-619.00A.
Chemische Werke Huls Aktiengesellschaft: *See*—
Kupper, Friedrich-Wilhelm; and Streck, Roland, 4,036,858, Cl. 260-348.50L.
Cheng, Shih-che; and Kaufman, Jay Stephen, to General Atomic Company. Heat exchanger tube bundle support system. 4,036,289, Cl. 165-82.000.
Cheron, Jacques, to Institut Francais du Petrole. Fuel cell. 4,037,022, Cl. 429-10.000.
Cheron, Jacques: *See*—
Grehier, Alain; and Cheron, Jacques, 4,037,023, Cl. 429-12.000.
Chevalier, Alfred Eugene. Goods stowage unit. 4,036,370, Cl. 211-162.000.
Chevron Research Company: *See*—
Chan, David Cheong King, 4,036,960, Cl. 424-248.500.
Meader, Arthur L., Jr., 4,036,797, Cl. 260-28.00R.
Morgan, Barry S.; and Sandell, Richard P., 4,036,918, Cl. 261-114.00R.
Roselius, Ronald R.; and Edeleanu, Alexander G., 4,036,735, Cl. 208-89.000.
Schmidt, Robert J., deceased; and Graf, Peter E., 4,036,661, Cl. 106-273.00N.
Chigirin, Jury Trofimovich: *See*—
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.
Chihiro, Oizumi; and Juno, Uesugi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of fuel kernels. 4,036,920, Cl. 264-.500.
Chlebda, Kazimirz. Spool holder. 4,036,418, Cl. 224-48.00F.
Chopdekar, Vilas M., to M & T Chemicals Inc. Process for preparing triarylphosphines. 4,036,889, Cl. 260-606.50P.
Choporis, Peter N.; and Choporis, Robert N. Portable conditioned air breathing pipe. 4,036,224, Cl. 128-212.000.
Choporis, Robert N.: *See*—
Choporis, Peter N.; and Choporis, Robert N., 4,036,224, Cl. 128-212.000.
Chopra, Gopal Mohan; Gangadharan, Tyagaraja; and Sinha, Ram Narain, to Indian Explosives Limited. Rigid waterproof container for slurried explosives in small diameters. 4,036,138, Cl. 102-24.00R.
Chretien, Gilbert; Ditacroute, Gerard; and Meyer, Jacques, to Rhone-Poulenc Industries. Preparation of varnishes based on polyester resin. 4,036,908, Cl. 260-863.000.
Christensen, Craig M., to Noctua, Inc. Laser doppler velocimeter. 4,036,557, Cl. 356-28.000.
Christensen, Nils J.: *See*—
Levy, Joseph; and Christensen, Nils J., 4,036,899, Cl. 260-654.00R.
Christiana Metals Corporation: *See*—
Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,036,397, Cl. 220-268.000.
Chromalloy American Corporation: *See*—
Dean, Michael F.; and Blize, Roy L., 4,036,602, Cl. 428-621.000.
Ciba-Geigy Corporation: *See*—
Finch, Neville, 4,036,965, Cl. 424-266.000.
Lohmann, Frank, 4,036,778, Cl. 252-301.210.
Cimpoias, Ion: *See*—
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.
Civolani, Bruno; and Benelli, Paolo. Radial percussion arrangement for firearms using self-propelling ammunition with peripherial priming. 4,035,943, Cl. 42-69.00B.
CKD Praha, oborovy podnik: *See*—
Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246, Cl. 357-82.000.
Clark, Calvin M.; and D'Attilio, Americo P., to Stanadyne, Inc. Heavy duty hole saw and arbor assembly. 4,036,560, Cl. 408-204.000.
Clark, Dwaine H. Motorcycle chain guide and tensioner. 4,036,069, Cl. 74-242.1TA.
Clark Equipment Company: *See*—
Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, 4,036,372, Cl. 212-144.000.
Clark, Leslie: *See*—
Pinder, Russell Stuart; and Clark, Leslie, 4,036,645, Cl. 136-89.00C.
Clark, Marion D.; and Manuccia, Thomas J., to United States of America, Navy. Hydrogen isotope separation. 4,036,720, Cl. 204-177.000.
Clark, Robert P.; and Miller, Eugene F., to Xerox Corporation. Weighted pinch rolls. 4,036,421, Cl. 226-185.000.
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., to United States of America, Army. Retina for pyroelectric vidicon. 4,037,131, Cl. 313-388.000.
Clarke, Anthony Bayliss: *See*—
Roy, Alexander Rose; and Clarke, Anthony Bayliss, 4,036,937, Cl. 423-446.000.
Clay, Byron Jan; Wall, Michael Lhotellier; and Cunningham, James Robert. Steam distillation apparatus convertible to two separate modes of operation. 4,036,701, Cl. 202-204.000.
Clayton, John Peter: *See*—
Ferres, Harry; and Clayton, John Peter, 4,036,829, Cl. 260-239.100.
Clem, William E.; and Nolan, John F., to Anchor Hocking Corporation. Universal head and intermediate grid for case packers. 4,035,986, Cl. 53-61.000.
Clement, Warren J., to Sprague Electric Company. Wet electrolyte valve metal capacitor with a free-form encapsulant. 4,035,905, Cl. 29-570.000.
Clenet, Alain Jean-Marie. Truck cover assembly. 4,036,521, Cl. 296-100.000.
Cliff, Thomas Charles, to United Gas Industries Limited. Thermal system. 4,036,059, Cl. 73-368.000.
Clifton, Brian: *See*—
Fell, Roger; and Clifton, Brian, 4,036,051, Cl. 73-193.00R.
Coal Industry (Patents) Limited: *See*—
Martin, Terence Geoffrey, 4,036,731, Cl. 208-8.000.
Cocanour, Paul M.: *See*—
Pemrick, Raymond E.; and Cocanour, Paul M., 4,035,961, Cl. 51-295.000.
Coffee, Edward Charles John: *See*—
Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, 4,036,872, Cl. 260-468.00D.
Cohen, Philip: *See*—
Alexander, Merwin K.; Meyer, Daniel J.; and Cohen, Philip, 4,036,459, Cl. 248-11.000.
Cojocaru, Iosif: *See*—
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.
Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, to International Standard Electric Corporation. Electronic dipole for looping a telephone line. 4,037,120, Cl. 307-311.000.
Colgate-Palmolive Company: *See*—
Baines, Eric; Forshaw, Sydney James; and Harvey, Kenneth, 4,036,950, Cl. 424-54.000.
Colodney, Daniel, 4,036,949, Cl. 424-49.000.
Collinson, Alfred Edward: *See*—
Betts, Colin; Collinson, Alfred Edward; and Hart, David Frederick, 4,036,690, Cl. 176-40.000.
Colodney, Daniel, to Colgate-Palmolive Company. Clear dentifrice. 4,036,949, Cl. 424-49.000.
Colt International Limited: *See*—
Burtenshaw, Raymond Alfred Frank, 4,036,120, Cl. 98-43.00R.
Combest, John F., to R. L. Kuss & Co., Inc. Fluid filter. 4,036,758, Cl. 210-223.000.
Cominco Ltd.: *See*—
Deane, Richard; and Sylvest, Aage C., 4,037,191, Cl. 340-28.000.
Commissariat a l'Energie Atomique: *See*—
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.0LC.
Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl. 423-488.000.
Communications Patents Limited: *See*—
Kalanit, Gideon, 4,037,153, Cl. 324-122.000.
Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.E.C.A.): *See*—
Dubois, Jean Claude; and Le Goux, Jean Jacques, 4,036,777, Cl. 250-299.000.
Compagnie Generale d'Electricite: *See*—
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,037,027, Cl. 429-104.000.
Le Mehaute, Alain; and Bordet, Philippe, 4,037,028, Cl. 429-104.000.

Compagnie Honeywell Bull (Societe Anonyme): *See*—
Goujon, Roger Hubert; Menard, Jacques Pierre Raymond Raphael; and Pagny, Georges Claude Andre, 4,037,156, Cl. 324-158.00R.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Wolff, Paul, 4,036,109, Cl. 91-216.00A.
Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See*—
Mueller, Willy, 4,037,053, Cl. 179-6.00R.
Comte, Marie Helene: *See*—
Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, 4,037,120, Cl. 307-311.000.
Concast AG: *See*—
Rohrig, Adalbert; Willim, Fritz; and Hannah, Brian, 4,036,280, Cl. 164-82.000.
Conger, Marvin T.; and Beers, Roger N., to Goodyear Tire & Rubber Company, The. Run-flat tire lubricant. 4,036,765, Cl. 252-21.000.
Congoleum Corporation: *See*—
Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., 4,036,673, Cl. 156-71.000.
Conkey, James Elliott, to Kibbey Machine Company, Incorporated. Machine of cutting cores of vegetables. 4,036,123, Cl. 99-538.000.
Consolidated Valve Industries, Inc.: *See*—
Dashner, James W., 4,036,250, Cl. 137-476.000.
Constantine, Henry G., to Avondale Shipyards, Inc. Workpiece orientation column and process. 4,036,107, Cl. 90-11.00C.
Continental Copper & Steel Industries, Inc.: *See*—
De Walt, Maurice P., 4,036,670, Cl. 148-12.100.
Continental Oil Company: *See*—
Hawthorne, Arthur L.; and Hazen, David R., 4,036,529, Cl. 299-19.000.
Control Data Corporation: *See*—
Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.
Cook, Albert M.: *See*—
Hillsman, Deane; Cook, Albert M.; and Simes, James G., 4,036,221, Cl. 128-145.600.
Cooper, Herbert Warren: *See*—
Moore, Robert A.; and Cooper, Herbert Warren, 4,037,174, Cl. 333-30.00R.
Cooper Industries, Inc.: *See*—
Hartwick, William F.; and Melcher, Charles H., 4,036,251, Cl. 137-512.100.
Coquin, Gerald Allan; Maldonado, Juan Ramon; Maydan, Dan; and Somekh, Sasson Roger, to Bell Telephone Laboratories, Incorporated. Mask structures for X-ray lithography. 4,037,111, Cl. 250-505.000.
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Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,036,816, Cl. 260-59.00R.
Cordell, Robert Roger, to Bell Telephone Laboratories, Incorporated. High speed tone decoder utilizing a phase-locked loop. 4,037,171, Cl. 331-14.000.
Cornell, Richard Henry, to General Electric Company. Fuel supply and distribution system. 4,036,246, Cl. 137-118.000.
Cornett, Lee G.; and Peterson, Wesley D., to Rockwell International Corporation. Means for attaching a ferrite transducer to a disk resonator. 4,037,178, Cl. 333-71.000.
Cornwell, Charles E.: *See*—
Plunguian, Mark; and Cornwell, Charles E., 4,036,839, Cl. 264-256.000.
Costa, Thomas A., to Admiral Corporation. Convergence circuit mounting device. 4,037,256, Cl. 358-248.000.
Cotton Incorporated: *See*—
Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., 4,035,869, Cl. 19-80.00R.
Couderc, Pierre; and Hilmoine, Serge, to Societe Chimique des Charbonnages. Process for the production of hydroxy-pivaldehyde. 4,036,888, Cl. 260-602.000.
Courtemanche, Richard D.: *See*—
Deeg, Emil W.; and Courtemanche, Richard D., 4,036,623, Cl. 65-30.00E.
Courtwright, Robert M., to Hauserman, Inc. Knock-down drawer construction. 4,036,542, Cl. 312-330.00R.
Courty, Aurele. Automobile high beam glare warning device. 4,037,197, Cl. 340-107.000.
Cowan, Arnold A.: *See*—
Thompson, John T.; and Cowan, Arnold A., 4,036,335, Cl. 188-319.000.
Cowan, Braughler: *See*—
Perry, Eric; Heath, Roy T.; Rost, Lee F.; and Cowan, Braughler, 4,036,382, Cl. 214-313.000.
Cowit, Burt L., to Raymond Lee Organization, Inc., The, a part interest. Flat tire indicating device. 4,037,192, Cl. 340-58.000.
Cox, John T.: *See*—
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,037,131, Cl. 313-388.000.
Craig, Burnie M., to Fond, Loren S. Elastomeric cartridge with slitted nozzle tip. 4,036,412, Cl. 222-490.000.
Crane, Jack W.; and Mast, Aquila D. Crop material roll forming method and machine. 4,035,999, Cl. 56-341.000.
Cranmer, Terrence V. Braille display switching matrix and circuit utilizing the same. 4,037,200, Cl. 340-166.00R.
Crask, Roy I.; and Egerer, William D., to Buckbee-Mears Company. Lightning arrester. 4,037,139, Cl. 361-58.000.
Crawford, Wheeler C.; Yamamoto, Roy I.; and Cusano, Carmen M., to Texaco Inc. Polymethacrylate and lube composition thereof. 4,036,768, Cl. 252-51.50A.
Crawford, Wheeler C.: *See*—
Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,766, Cl. 252-51.50A.
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Creative Learning, Inc.: *See*—
Lambert, Edmund Baker, 4,035,930, Cl. 35-22.00R.
Cresswall, Thomas A., to Cresswall, Thomas A. Method and apparatus for inserting soft prosthesis. 4,035,850, Cl. 3-36.000.
Creusot-Loire: *See*—
Morlet, Jean G.; Honnorat, Yves C.; and Raisson, Gerard D., 4,036,568, Cl. 425-8.000.
Criblez, Roger, to Hatebur Umformmaschinen AG. Device for shearing rod sections on an automatic multi-stage cross-fed press. 4,036,089, Cl. 83-198.000.
Crosby, John; Rennie, Robert Allan Campbell; and Paton, Robert Michael, to Imperial Chemical Industries Limited. 2,4-Diisocyanato bicyclo (3,3,0)-oct-6-ene. 4,036,869, Cl. 260-453.0AP.
Crosfield Electronics Limited: *See*—
Pugsley, Peter C.; and Kellner, Philip R., 4,037,075, Cl. 219-121.0LM.
Pugsley, Peter C., 4,037,249, Cl. 358-76.000.
Cross, Christopher G.: *See*—
Carroll, Thomas D.; and Cross, Christopher G., 4,036,622, Cl. 65-3.00R.
Crow, Arthur F., Jr. Wheel mounting for cultivator planter. 4,036,304, Cl. 172-260.000.
Crow, John L., Jr.: *See*—
Boyles, Bruce K.; and Crow, John L., Jr., 4,036,941, Cl. 423-558.000.
Crown Zellerbach Corporation: *See*—
Back, Sangho E.; and Reba, Imants, 4,036,679, Cl. 162-9.000.
Reba, Imants; Hogland, Gerald Hugh; and Wolthausen, Edward Clair, 4,035,870, Cl. 19-155.000.
Cruzan, Charles G., to Phillips Petroleum Company. Sample dilution. 4,036,062, Cl. 73-422.0GC.
Cruzen, Harry F.; and Gresham, Robert W., to Besser Company. Cementitious product making system with product height gauging mechanism. 4,036,570, Cl. 425-141.000.
Cryogenic Technology, Inc.: *See*—
Bamberg, Walter H., 4,036,027, Cl. 62-6.000.
Leonard, Kenneth R.; and DeHaan, James R., 4,036,617, Cl. 62-55.000.
Leonard, Kenneth R.; and Loudon, John D., 4,036,618, Cl. 62-55.000.
Culton, Jon: *See*—
Kansy, Robert; and Culton, Jon, 4,037,175, Cl. 333-30.00R.
Cunningham, James Robert: *See*—
Clay, Byron Jan; Wall, Michael Lhotelier; and Cunningham, James Robert, 4,036,701, Cl. 202-204.000.
Curran, William Vincent; Tomcufcik, Andrew Stephen; and Ross, Adma Schneller, to American Cyanamid Company. 1-(Para-substituted-phenyl)-1H-tetrazoles. 4,036,849, Cl. 260-308.00D.
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Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,766, Cl. 252-51.50A.
Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,767, Cl. 252-51.50A.
Cusato, Anthony J., to Dentronix, Inc. Direct bonding bracket positioning and mounting tool. 4,035,919, Cl. 32-66.000.
Cycowicz, Izchak; and Gill, Glenn G., to Mohasco Corporation. Pull out sofa bed. 4,035,852, Cl. 5-13.000.
Czelen, John Cas. Contact lens cases. 4,036,357, Cl. 206-5.100.
Dabill, David William: *See*—
Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592, Cl. 23-232.00E.
Dacor Corporation: *See*—
Briley, Ronald D.; and Pedersen, Vernon G., 4,035,857, Cl. 9-342.000.
da Costa, Nicholas Mario: *See*—
Howes, John Gordon Bernard; da Costa, Nicholas Mario; Selway, Rupert Alec; and Potter, William Duncan, 4,036,814, Cl. 260-47.0UA.
Dadian, Thomas F., to United States of America, Air Force. Lighting system for selective back lighting. 4,035,939, Cl. 40-132.00D.
Dahl, Norman C. Process for the preuse work-hardening of bolts. 4,035,858, Cl. 10-27.00H.
Dahlkvist, Nils Goran; Axelsson, Lars Bengt; and Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Device for discontinuing and automatically restoring the operational function of a spring brake actuator. 4,036,111, Cl. 92-29.000.
Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, to Daimler-Benz Aktiengesellschaft. Filter for cleaning lubricating oil in internal combustion engines. 4,036,755, Cl. 210-168.000.
Daimler-Benz Aktiengesellschaft: *See*—
Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, 4,036,341, Cl. 192-106.200.
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Hufendiek, Ernst-Wilhelm, 4,036,340, Cl. 192-.084.
Loper, Bernd, 4,037,134, Cl. 315-78.000.
Schreiber, Winfried, 4,036,449, Cl. 242-107.000.
Tank, Eggert; and Stute, Manfred, 4,036,293, Cl. 165-134.000.

Daiwa Boseki Kabushiki Kaisha: *See—*
Kobayashi, Akira, 4,036,002, Cl. 57-58.890.

Dalenberg, Paul N.: *See—*
Floyd, James R.; Dalenberg, Paul N.; and Slivensky, Robert B., 4,036,505, Cl. 277-96.200.

D'Alessio, Frank P.; and Koenig, Erl A., to G P I. Safety ski binding. 4,036,510, Cl. 280-613.000.

Dalton, Thomas B., to Westran Corporation. Valve. 4,036,467, Cl. 251-14.000.

Dalzell, Haldean Cloyce: *See—*
Razdan, Raj Kumar; and Dalzell, Haldean Cloyce, 4,036,857, Cl. 260-345.300.

Dana Corporation: *See—*
Guenther, William D., 4,036,184, Cl. 123-75.00B.

Daniels, David, to General Foods Corporation. Vacuum pocket-opening turret. 4,035,988, Cl. 53-183.000.

Darsie, Burns; and Schewe, Richard A., to Barber-Colman Company. Triaxial weaving machine with warp strand guides. 4,036,262, Cl. 139-11.000.

Dart Industries Inc.: *See—*
Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., 4,037,011, Cl. 428-294.000.

Dashner, James W., to Consolidated Valve Industries, Inc. Blow-down safety valve. 4,036,250, Cl. 137-476.000.

D'Attilio, Americo P.: *See—*
Clark, Calvin M.; and D'Attilio, Americo P., 4,036,560, Cl. 408-204.000.

Davey Tree Expert Company, The: *See—*
Funk, Roger Calvin, 4,036,627, Cl. 71-29.000.

Davidson, James John Alexander, to W. R. Grace & Co. Sealing gaskets for container closures. 4,036,388, Cl. 215-341.000.

Davies, Peter Gough; Jones, Keith Thomas; and Salmon, Brian, to GKN Somerset Wire Limited. Wire drawing. 4,036,046, Cl. 72-286.000.

Davies, Robert W.; Thornton, Leonard; Veness, Maxwell F.; and Calver, Leonard H., to Molins Limited. Packing machines. 4,036,117, Cl. 93-51.00R.

Davis, Albert Sidney; Davis, Robert William; and Weber, Joseph Paul. Gate valve with expandable and contractable closure member. 4,036,260, Cl. 138-94.300.

Davis, Guy E.; Lardi, Francesco; and Ghrist, William D., III, to Westinghouse Electric Corporation. Wide load range system for transferring turbine or plant operation between computers in a multiple computer turbine and power plant control system. 4,037,088, Cl. 235-151.210.

Davis, Michael Ian: *See—*
Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, 4,037,214, Cl. 364-200.000.
Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215, Cl. 364-200.000.

Davis, Robert William: *See—*
Davis, Albert Sidney; Davis, Robert William; and Weber, Joseph Paul, 4,036,260, Cl. 138-94.300.

Dawson, John Victor: *See—*
Evans, Edward Raymond; and Dawson, John Victor, 4,036,641, Cl. 75-130.00A.

Dayco Corporation: *See—*
Sprague, George R., 4,037,013, Cl. 428-310.000.

DCA Food Industries Inc.: *See—*
Kaufman, Harold B., Jr.; Moyer, John H.; and McCarthy, John P., 4,037,071, Cl. 219-10.55F.

De La Rue Giori S.A.: *See—*
Giori, Gualtiero, 4,036,130, Cl. 101-170.000.

Dean, Gordon B.: *See—*
Pickton, Shailer T.; and Dean, Gordon B., 4,037,164, Cl. 328-187.000.

Dean, Michael F.; and Blize, Roy L., to Chromalloy American Corporation. Diffusion coating of magnesium in metal substrates. 4,036,602, Cl. 428-621.000.

DeAnda, Cesar C.: *See—*
Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.

Deane, Richard; and Sylvest, Aage C., to Cominco Ltd. Aircraft warning marker assembly for power lines. 4,037,191, Cl. 340-28.000.

DeAngelis, Armand: *See—*
Laliberte, Albert J.; and DeAngelis, Armand, 4,036,168, Cl. 118-8.000.

de Cremoux, Baudouin, to Thomson-CSF. Avalanche photodiode. 4,037,244, Cl. 357-30.000.

Dedolph, Richard R., to Gravi-Mechanics Co. Container of stabilized media with growing plant therein and method of making the same. 4,035,951, Cl. 47-66.000.

Deeg, Emil W.; and Courtemanche, Richard D., to American Optical Corporation. Method of making hardened ophthalmic lenses by ion exchange. 4,036,623, Cl. 65-30.00E.

Deeg, Emil W.: *See—*
Krohn, David A.; and Deeg, Emil W., 4,036,624, Cl. 65-30.00R.

Deffeyes, Robert J., to Graham Magnetics Incorporated. Package having dessicant composition. 4,036,360, Cl. 206-204.000.

Deffner, John F., to Visual Marketing Incorporated. Audio-visual display device. 4,035,941, Cl. 40-219.000.

Deficis, Alain, to Agence Nationale de Valorisation de la Recherche (ANVAR). Temperature measuring process and probe. 4,036,060, Cl. 73-368.000.

DeHaan, James R.: *See—*
Leonard, Kenneth R.; and DeHaan, James R., 4,036,617, Cl. 62-55.000.

De Haeck, Robert Jean, to La Soudure Electrique Autogene, Procedes Arcos, S.A. Flux for the submerged arc welding of ordinary, semi-alloyed or special steels. 4,036,671, Cl. 148-24.000.

Deiwick, Horst: *See—*
Manthey, Willi; and Deiwick, Horst, 4,036,243, Cl. 134-76.000.

Delessert, Georges: *See—*
Matthey, Henri; and Delessert, Georges, 4,036,458, Cl. 242-201.000.

Dellenberg, Hugo, to Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung. Apparatus for removing the drillings from the drilling site of a drill. 4,036,308, Cl. 173-75.000.

DeLuca, Raymond F.: *See—*
Jespersen, Paul W.; and DeLuca, Raymond F., 4,036,406, Cl. 222-181.000.

DeLuish, Kenneth R., to HYCALOG Inc. Well jar. 4,036,312, Cl. 175-302.000.

DeMarco, Thomas M., to NFE International, Ltd. Pressure relief means for industrial vacuum. 4,036,614, Cl. 55-310.000.

Demerson, Christopher A.: *See—*
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,036,842, Cl. 260-293.580.

Demetrescu, Teodor: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.

de Mul, Erik Francois Johannes. Dental instrument. 4,035,918, Cl. 32-54.000.

Denis, Jacques; and Parc, Guy, to Institut Francais du petrole. Lubricating bases for multigrade oils. 4,036,771, Cl. 252-56.00R.

de Nora, Vittorio: *See—*
Nidola, Antonio; de Nora, Vittorio; and Spaziante, Placido M., 4,037,032, Cl. 429-198.000.

Dentronix, Inc.: *See—*
Cusato, Anthony J., 4,035,919, Cl. 32-66.000.

DeRees, Delbert D.; and Pinsonneault, Jacques Emile, to American Motors Corporation. Vehicle body roof construction. 4,036,522, Cl. 296-154.000.

de Rooij, Abraham H.; and Goettsch, Reijer, to Stamicarbon B.V. Process for the recovery of pure ϵ-caprolactam from an aqueous solution thereof. 4,036,830, Cl. 260-239.30A.

DeRosa, John A.: *See—*
Fraioli, Anthony V.; and DeRosa, John A., 4,036,634, Cl. 75-.50A.

Derrick, Danny O'Brian: *See—*
Ruff, George Robert; and Derrick, Danny O'Brian, 4,036,325, Cl. 182-46.000.

DeSmit, Phillip A., to Unifab Corporation. Bio-test cage and support therefor. 4,036,177, Cl. 119-18.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,036,800, Cl. 260-29.2TN.

Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, to Compagnie Generale d'Electricite. Sodium-sulphur electric cell and method of forming same. 4,037,027, Cl. 429-104.000.

Dessel, Joseph Leo: *See—*
Bonner, Gilbert Belmont; and Dessel, Joseph Leo, 4,037,122, Cl. 310-14.000.

De Steur, Hubert: *See—*
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.

Deutsch, Jean-Claude: *See—*
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.0LC.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Laufer, Siegmar; and Roy, Waldemar, 4,036,933, Cl. 423-338.000.

De Vogelaere, Marc: *See—*
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.

De Walt, Maurice P., to Continental Copper & Steel Industries, Inc. Tool steel. 4,036,670, Cl. 148-12.100.

De Wild, Willem Reindert, to U.S. Philips Corporation. Electromechanical filter. 4,037,180, Cl. 333-72.000.

Dey, Arabinda N., to P. R. Mallory & Co., Inc. Method of making a miniature concentric battery. 4,035,909, Cl. 29-623.200.

Dey, Arabinda N.; and Schlaikjer, Carl R., to P. R. Mallory & Co., Inc. Halogen fueled organic electrolyte fuel cell. 4,037,025, Cl. 429-29.000.

Dhingra, Ashok Kumar, to Du Pont de Nemours, E. I., and Company. Polycrystalline alumina fibers as reinforcement in magnesium matrix. 4,036,599, Cl. 428-608.000.

Diamond Shamrock Corporation: *See—*
Babinsky, Andrew D.; and Benezra, Leo L., 4,036,717, Cl. 204-153.000.
Babinsky, Andrew D., 4,036,728, Cl. 204-283.000.

Diamond Shamrock Technologies S.A.: *See—*
Nidola, Antonio; de Nora, Vittorio; and Spaziante, Placido M., 4,037,032, Cl. 429-198.000.

Dickey, Charles M.: *See—*
Korr, Abraham L.; Walker, Evan Harris; Dickey, Charles M.; and Bushey, Bransby W., 4,036,140, Cl. 102-38.000.
Korr, Abraham L.; Walker, Evan Harris; and Dickey, Charles M., 4,036,141, Cl. 102-38.000.

Dierschke, Eugene Gustav, to Texas Instruments Incorporated. Shaped emitters with buried-junction structure. 4,037,241, Cl. 357-17.000.

Diesel Kiki Co.: *See—*
Nakayama, Kenji, 4,036,192, Cl. 123-139.0AT.
Diesel Kiki Kabushiki Kaisha: *See—*
Kobayashi, Masayoshi; and Kimura, Takeo, 4,036,193, Cl. 123-139.0AB.
Dietrich, Hans, to Losinger AG of Bern. Method and means of extracting a soil anchor consisting of a prestressed steel tendon. 4,036,137, Cl. 102-23.000.
Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Centering circuit for a television deflection system. 4,037,137, Cl. 315-398.000.
Dishaw, James: *See—*
Essenmacher, Albert M.; Krause, Thomas R.; and Dishaw, James, 4,037,198, Cl. 340-146.3ED.
Ditacroute, Gerard: *See—*
Chretien, Gilbert; Ditacroute, Gerard; and Meyer, Jacques, 4,036,908, Cl. 260-863.000.
Dixie-Narco, Inc.: *See—*
Burton, Paul F., 4,036,621, Cl. 62-394.000.
Oden, Kenneth W., 4,036,400, Cl. 221-67.000.
Dixon, Cal L.; and Ross, Charles E., to Kaiser Aluminum & Chemical Corporation. Storage rack and hanger assembly. 4,036,366, Cl. 211-4.000.
Dixon, Robert L.; and Maxsted, Malcolm D., to Smith International, Inc. Mounting for inboard cutters on a raise drill. 4,036,313, Cl. 175-344.000.
Dixon, Robert L.; and Allison, Robert E., to Smith International, Inc. Hole opener with improved rotary cutter mounting. 4,036,314, Cl. 175-364.000.
DMI Inc.: *See—*
Kinzebaw, Jon E., 4,036,306, Cl. 172-287.000.
Kinzenbaw, Jon E., 4,036,305, Cl. 172-283.000.
Dobrzanski, John; Gardner, Edward Boyd; and Hart, Ernest V., to Emhart Industries, Inc. Ionization smoke detector and alarm system. 4,037,206, Cl. 340-237.00S.
Dobson Park Industries, Ltd.: *See—*
Phillips, Reginald Andrew, 4,036,108, Cl. 91-165.000.
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., to American Home Products Corporation. Process for preparing polycyclic heterocycles having a pyran ring. 4,036,842, Cl. 260-293.580.
Dockery, Denzel J. Aquarium filter assembly. 4,036,756, Cl. 210-169.000.
Dodge, Larry H.; and Economidy, Byron G., to Sherwood Medical Industries Inc. Thoracic drainage unit with defoaming means. 4,036,231, Cl. 128-276.000.
Doi, Toshitada, to Sony Corporation. Sound pickup assembly. 4,037,052, Cl. 179-1.0MF.
Doll, Henri Georges, to Doll Research, Inc. Apparatus and method for eliminating perturbations of a kinetic origin in the blood flow waveform. 4,036,215, Cl. 128-2.05F.
Doll Research, Inc.: *See—*
Doll, Henri Georges, 4,036,215, Cl. 128-2.05F.
Dompas, Leon Eugenie Daniel. Structure having vertical bearer walls and horizontal ceilings. 4,035,966, Cl. 52-73.000.
Donaldson, Donald J.: *See—*
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.
Donovan, James, to Artisan Industries Inc. Apparatus and system for stabilizing the disc elements of a rotary concentrator for solids-containing fluids. 4,036,759, Cl. 210-298.000.
Dooley, Joseph L.; and Yelke, Edward. Engine monitoring apparatus. 4,036,050, Cl. 73-119.00A.
Dorer, Casper John, Jr., to Lubrizol Corporation, The. Esters made from the reaction product of low molecular weight ethylenically unsaturated acylating agents and oxidized ethylene-propylene interpolymers. 4,036,772, Cl. 252-56.00R.
Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, to Siemens Aktiengesellschaft. Nuclear reactor installation. 4,036,700, Cl. 176-87.000.
Dorr-Oliver Incorporated: *See—*
Nauta, Robin Gustav, 4,036,153, Cl. 110-8.00F.
Douce, Donald R.; and Buford, Wesley E. Automatic take-up winch. 4,036,476, Cl. 254-172.000.
Dover Corporation: *See—*
Wilder, Paul R.; and Wood, Chester W., 4,036,259, Cl. 137-801.000.
Wilson, Fred A., 4,036,255, Cl. 137-587.000.
Dow Chemical Company, The: *See—*
Best, John S., 4,036,285, Cl. 165-45.000.
Chang, Kuo Yuan, 4,036,854, Cl. 260-343.20R.
Habermann, Clarence E., 4,036,879, Cl. 260-561.00N.
Olstowski, Franciszek, 4,036,820, Cl. 260-77.5AM.
Stude, Duane L., 4,036,659, Cl. 106-90.000.
Downey, Richard W. Sleeving form for masonry material. 4,035,976, Cl. 52-577.000.
Dragerwerk Aktiengesellschaft: *See—*
Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.
Drankovsky, Ivan Karpovich: *See—*
Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich; Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich, 4,036,425, Cl. 233-2.000.
Dreher, Alfred J., to Dreher, Alfred J. Apparatus with reversing linear traverse mechanism for spraying material. 4,036,437, Cl. 239-186.000.
Dreissen, Hubert H.: *See—*
Basten, Albert T.; and Dreissen, Hubert H., 4,036,441, Cl. 241-20.000.
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, to Bergwerksverband GmbH. Device for closing off a mine gallery especially for use to prevent spreading of underground explosions. 4,036,024, Cl. 61-42.000.
Dresser Industries, Inc.: *See—*
Eddy, Kenneth Harmon; and McGill, Kenneth Harmon, 4,036,508, Cl. 280-492.000.
Dubois, Jean Claude; and Le Goux, Jean Jacques, to Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.E.C.A.). Ion current measuring arrangement. 4,036,777, Cl. 250-299.000.
Dubois, Jean Claude: *See—*
Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, to Institutul de Cercetari si Proiectari de Masini Agricole - ICPMA. Device for automatic adjustment of the position of the cutting platform of a grain harvesting machine. 4,035,997, Cl. 56-209.000.
Ducellier & Cie: *See—*
Chateau, Louis Jean, 4,036,199, Cl. 123-148.00E.
Dugge, Richard H., to ACF Industries, Incorporated. Hopper having means for directing blasts of gas to a discharge outlet or the hopper. 4,036,408, Cl. 222-193.000.
Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, to Commissariat a l'Energie Atomique. Method for recovery of hydrogen chloride from dilute solutions. 4,036,939, Cl. 423-488.000.
Dulou, Raymond; Magnin, Pierre; and Bechtel, Pierre, to So. Ci. Bre. Process for the manufacture of a new derivative of alpha-pinene and new medicaments based on this derivative. 4,036,884, Cl. 260-586.00G.
Dunk, Thomas H. Antenna mount. 4,037,229, Cl. 343-715.000.
Du Pont de Nemours, E. I., and Company: *See—*
Dhingra, Ashok Kumar, 4,036,599, Cl. 428-608.000.
Hannover, Finn, 4,036,514, Cl. 285-222.000.
Jacobson, Howard Wayne, 4,036,653, Cl. 106-47.00R.
James, Daniel Shaw; and Witterholt, Vincent Gerard, 4,036,585, Cl. 8-1.0XA.
Lee, Kyu Tai, 4,036,962, Cl. 424-258.000.
Poirier, Robert Victor, 4,036,802, Cl. 260-296.00F.
Rowe, Marvin Herbert, 4,036,586, Cl. 8-37.000.
Schwalenstocker, Henry John, Jr., 4,036,649, Cl. 96-107.000.
Spitzer, Robert, 4,036,714, Cl. 204-99.000.
Straub, John Frederick, 4,036,206, Cl. 126-270.000.
Turnbull, John William, 4,036,907, Cl. 260-857.00L.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Amidino compounds. 4,036,971, Cl. 424-273.000.
Durholz, Friedrich: *See—*
Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R.
Durland, Douglas Howard; and McGilvray, Malcolm Canmore, Jr., to Beckman Instruments, Inc. Fluid pressure operated eddy current brake for air driven centrifuge. 4,036,428, Cl. 233-23.00R.
Durum, Metin Mustafa, to Borg-Warner Corporation. Universal joint. 4,036,032, Cl. 64-21.000.
DuVall, Wilbur E., to Xerox Corporation. Keyboard encoding system with electronic hysteresis. 4,037,225, Cl. 340-365.00E.
Dvoracek, Pavel: *See—*
Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, 4,036,265, Cl. 139-190.000.
Dynamit Nobel Aktiengesellschaft: *See—*
El-Chahawi, Moustafa; and Vollkommer, Norbert, 4,036,819, Cl. 260-75.00H.
Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, 4,036,798, Cl. 260-28.00P.
Dynamit Nobel Aktiengesellschaft and Impex-Essen Vertrieb Von Werkzeugen GmbH: *See—*
Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R.
E-Systems, Inc.: *See—*
Johnson, Paul W., 4,037,072, Cl. 219-56.000.
Ear, Frank P., to H.G.C. Construction & Equipment Company, Inc. Method for abating odor and smoke emissions in the vapor exhaust from a meat broiling grill. 4,036,994, Cl. 426-233.000.
Eastman Kodak Company: *See—*
Baden, Harry C.; Bard, Charleton C.; and Brugger, Donald J., 4,036,715, Cl. 204-109.000.
Maigret, Robert J., 4,037,237, Cl. 354-51.000.
Eastmond, Bruce Charles, to Motorola, Inc. Two-way FM radio system operating on a single channel and providing simulated duplex operation. 4,037,158, Cl. 325-22.000.
Easton, Harlan. Branding iron with quickly changeable characters. 4,036,128, Cl. 101-9.000.
Eaton, Sargent Sheffield, Jr., to RCA Corporation. Protection circuit for insulated-gate field-effect transistors (IGFETS). 4,037,140, Cl. 361-56.000.
Ebauches S.A.: *See—*
Ramet, Gilbert, 4,036,171, Cl. 118-49.100.
Ebco Industries, Ltd.: *See—*
Eppich, Helmut, 4,036,430, Cl. 235-61.11E.

Eckels, Robert Edward. Electrically initiated fuse ignitor. 4,036,139, Cl. 102-28.00R.

Ecker, Hans, to Hochtemperatur-Reaktorbau GmbH. Heat exchanger assembly designed as a longitudinal counterflow device. 4,036,294, Cl. 165-154.000.

Economidy, Byron G.: *See*—
Dodge, Larry H.; and Economidy, Byron G., 4,036,231, Cl. 128-276.000.

Eddy, Kenneth Harmon; and McGill, Kenneth Harmon, to Dresser Industries, Inc. Self-propelled drilling and workover rig. 4,036,508, Cl. 280-492.000.

Edelberg, Murray; and Schissler, Lloyd R., to Sperry Rand Corporation. Digital memory with data manipulation capabilities. 4,037,205, Cl. 364-900.000.

Edeleanu, Alexander G.: *See*—
Roselius, Ronald R.; and Edeleanu, Alexander G., 4,036,735, Cl. 208-89.000.

Edge, George S., to Amerada Hess Corporation. Gangway system. 4,035,861, Cl. 14-71.100.

Effenberger, Hubert; and Seeger, Walter, to Glaser, Gunther; and Effenberger, Hubert. Time-keeping apparatus. 4,036,006, Cl. 58-23.00R.

Egerer, William D.: *See*—
Crask, Roy I.; and Egerer, William D., 4,037,139, Cl. 361-58.000.

Eidschun, Charles Douglas, Jr. Method for metal exchange. 4,036,705, Cl. 204-15.000.

Eisenberg, Stephanie, to Nash Metalware Co. Inc. Expandable rack. 4,036,369, Cl. 211-88.000.

Ekstrom, Gosta Ivar: *See*—
Sjostrand, Fritiof Stig; Lundmark, Anders Gunnar Rudolf; and Ekstrom, Gosta Ivar, 4,036,085, Cl. 81-52.300.

El-Chahawi, Moustafa; and Vollkommer, Norbert, to Dynamit Nobel Aktiengesellschaft. Unsaturated polyester resins. 4,036,819, Cl. 260-75.00H.

Elco Industries, Inc.: *See*—
Whitchurch, Donald G., 4,036,559, Cl. 403-405.000.

Electro Audio Dynamics, Inc.: *See*—
von Recklinghausen, Daniel R., 4,037,061, Cl. 179-115.5PV.

Electrohome Limited: *See*—
Sennik, John Joseph, 4,037,133, Cl. 315-31.0TV.

Elemelt Limited: *See*—
Holmes, Charles Chamberlain; Skinner, Wallace; and Mattocks, George Roland, 4,036,625, Cl. 65-134.000.

Elex A.G.: *See*—
Huppi, Xaver Johann, 4,036,610, Cl. 55-112.000.

Eli Bridge Company: *See*—
Novey, William E., 4,037,135, Cl. 315-194.000.

Ellefson, Larry P., to Interface Mechanisms, Inc. Label stripping apparatus for label printers. 4,036,132, Cl. 101-288.000.

Ellen, Peter Edington. Method of making a curved roof. 4,036,921, Cl. 264-32.000.

Elliott, William S.: *See*—
Strelioff, William P.; Elliott, William S.; and Johnson, Dale, 4,036,065, Cl. 73-432.00R.

Elmore, Donald Fenton, to Harris Corporation. Dampener. 4,036,131, Cl. 101-247.000.

Emhart Industries, Inc.: *See*—
Dobrzanski, John; Gardner, Edward Boyd; and Hart, Ernest V., 4,037,206, Cl. 340-237.00S.
Williams, Merton S., 4,035,921, Cl. 33-126.70R.

Enders, Edgar, to Bayer Aktiengesellschaft. 1-Aryl-5-alkylidene,2,4-dioxo-imidazolidines and process therefor. 4,036,850, Cl. 260-309.500.

Endo, Ichiro: *See*—
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased, 4,036,650, Cl. 96-114.100.

Endo, Kiyoshi: *See*—
Sugiyama, Iwakichi; Takaoka, Yukihisa; and Endo, Kiyoshi, 4,036,796, Cl. 260-22.0CA.

Endras, Gerhard: *See*—
Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, 4,036,024, Cl. 61-42.000.

Engel, Kurt: *See*—
Thorne, David Edward; and Engel, Kurt, 4,036,844, Cl. 260-295.00R.

Engelbach, Heinz; and Sprague, Michael Jolyon, to BASF Aktiengesellschaft. Production of anthraquinone. 4,036,860, Cl. 260-369.000.

Engelhardt, Albrecht: *See*—
Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, 4,036,988, Cl. 424-330.000.

Engelhardt, Bernard H.; and Mintz, Marcus, to Engelhardt, Bernard J. Liquid level measuring apparatus. 4,036,055, Cl. 73-312.000.

Engelhardt, Bernard J.: *See*—
Engelhardt, Bernard H.; and Mintz, Marcus, 4,036,055, Cl. 73-312.000.

Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, to International Business Machines Corporation. Highly conductive printing medium containing a halogenated hydrocarbon photoactivator and a tetrathiafulvalene or a related compound thereof. 4,036,648, Cl. 96-90.00R.

English, John Hershel; Griffiths, James Edward; and Zuk, Paul, to Bell Telephone Laboratories, Incorporated. Voltage surge protector. 4,037,266, Cl. 361-120.000.

Ennis, George E.; Ennis, George Thomas; and Nugent, John W. In-out automatic vehicle washing apparatus. 4,035,862, Cl. 15-53.0AB.

Ennis, George Thomas: *See*—
Ennis, George E.; Ennis, George Thomas; and Nugent, John W., 4,035,862, Cl. 15-53.0AB.

Epperson, Lee W. Clip for rendering a bola tie usable as a pendant. 4,035,873, Cl. 24-49.00S.

Eppich, Helmut, to Ebco Industries, Ltd. Manually operable card reader. 4,036,430, Cl. 235-61.11E.

Erfurth, Henning: *See*—
Rademachers, Jacob; Erfurth, Henning; and Hund, Franz, 4,036,662, Cl. 106-300.000.

Erickson, John W; Budrys, Vitolis; and Brown, Francis Barton, to Kobe, Inc. Combination pitot pump and centrifugal separator. 4,036,427, Cl. 233-10.000.

Eriksson, Stig-Lennart; and Gustafsson, Manfred Wallace, to Sandvik Aktiebolag. Toolholder. 4,035,890, Cl. 29-96.000.

Ernst Leitz G.m.b.H.: *See*—
Leitz, Ludwig; and Mandler, Walter, 4,037,238, Cl. 354-152.000.

Escher Wyss G.m.b.H.: *See*—
Biondetti, Mario, 4,036,683, Cl. 162-274.000.

Espenscheid, Wilton F.; Offenhauer, Robert D.; and Yan, Tsoung Y., to Mobil Oil Corporation. Stabilization of hydrocracked oils with amino nitrophenols. 4,036,770, Cl. 252-51.50R.

Espino, Ramon L.: *See*—
Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., 4,036,732, Cl. 208-11.0LE.

Essenmacher, Albert M.; Krause, Thomas R.; and Dishaw, James, to Burroughs Corporation. Apparatus for generating display enabling signals. 4,037,198, Cl. 340-146.3ED.

Ester, Margarete, heir: *See*—
Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.

Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, to veba-Chemie AG. Preparation of organic hydroperoxides. 4,036,890, Cl. 260-610.00B.

Ester, Wolfgang, heir: *See*—
Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.

Etablissement Public: Agence Nationale de Valorisation de Recherche (ANVAR): *See*—
Pouey, Michel, 4,036,558, Cl. 356-79.000.

Ethyl Corporation: *See*—
Keblys, Kestutis A., 4,036,809, Cl. 260-45.70P.

Eue, Ludwig: *See*—
Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 4,036,632, Cl. 71-93.000.

Evans, Edward Raymond; and Dawson, John Victor, to British Cast Iron Research Association. Cast iron. 4,036,641, Cl. 75-130.00A.

Evans, John Lorenz; and Zoltan, Bart Joseph, to Singer Company, The. Wide angle torquing scheme. 4,036,453, Cl. 244-3.160.

Eveland, Melborne D. Dental apparatus. 4,035,916, Cl. 32-32.000.

ExCel Engineering, Inc.: *See*—
Paules, Eugene H., 4,035,982, Cl. 53-22.00B.

Excor, Inc.: *See*—
Thorsell, Roland H., 4,036,093, Cl. 83-471.300.

Exxon Research and Engineering Company: *See*—
Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., 4,036,732, Cl. 208-11.0LE.
Jaros, Stanley E.; and Metrailer, William J., 4,036,750, Cl. 210-27.000.
Manne, Richard S.; Bethea, Sam R.; and Kelso, Edward A., 4,036,734, Cl. 208-57.000.
Plank, Don A., 4,037,034, Cl. 526-5.000.
Ryden, Joseph, Jr., 4,037,103, Cl. 250-341.000.
Saidla, Glen E. W., 4,036,923, Cl. 264-45.300.
Wristers, Jos; Siskin, Michael; and Porcelli, Joseph J., 4,036,737, Cl. 208-108.000.
Wristers, Jos, 4,036,738, Cl. 208-108.000.

Fabrique Nationale Herstal S.A. en abrege FN: *See*—
Gevers, Georges A., 4,035,944, Cl. 42-75.00B.

Farfaglia, Silvio T., to Phillips Petroleum Company. Heating the end of a tubular member. 4,035,926, Cl. 34-34.000.

Farkas, Daniel F.: *See*—
Brown, George E.; and Farkas, Daniel F., 4,035,925, Cl. 34-8.000.

Faul, Thomas L., to Otaco Limited. Transportation seating construction and system. 4,036,527, Cl. 297-454.000.

Faure, Jean-Christian, to Societe d'Assistance Technique pour Produits Nestle S.A. Freeze-drying of solid, liquid or paste-like products. 4,035,924, Cl. 34-5.000.

Favor, Robert R.: *See*—
Bell, Rex D.; and Favor, Robert R., 4,035,993, Cl. 56-13.100.

Feasey, Ronald George; and Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic polymers prepared from halophenols containing keto groups. 4,036,815, Cl. 260-49.000.

Feaster, William Wardock. Preparing blood and like samples. 4,036,387, Cl. 215-309.000.

Feeney, George W.: *See*—
Habeck, Bruce W.; and Feeney, George W., 4,037,016, Cl. 428-349.000.

Fegan, Frank Joseph; and Smith, William Harold, to Peace Medical. Gas dilution device. 4,036,253, Cl. 137-556.000.

Fehler, Adolf; and Kirschey, Gunter, to Motoren- und Turbinen-Union Munchen GmbH. Combustion chamber for gas turbine power plants

having devices for the gaseous processing of the fuel being introduced therein. 4,036,582, Cl. 431-352.000.
Feit, Eugene David; and Schwartz, Newton, to Bell Telephone Laboratories, Incorporated. Technique for nucleating b.c.c. tantalum films on insulating substrates. 4,036,708, Cl. 204-38.00A.
Feld, Jerome H. Fabric spreading carriage for face up, one way operation having fabric clamping cutting assembly. 4,036,090, Cl. 83-282.000.
Feldman, Edward; and Lupinacci, George, to Sweda International, Inc. Combined mechanism for impacting a print member and advancing a printing ribbon. 4,036,349, Cl. 197-151.000.
Feldmesser, Julius: *See—*
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,036,987, Cl. 424-325.000.
Felip Sugranes, Jose, to Foret, S. A. Rotary furnace for the continuous manufacture of solid alkaline silicates. 4,036,583, Cl. 432-117.000.
Fell, Roger; and Clifton, Brian. Heat meters. 4,036,051, Cl. 73-193.00R.
Fergason, James L. Liquid crystal electromechanical transducer. 4,037,062, Cl. 179-133.000.
Ferguson, Paul M., to Tesco Engineering Company. Apparatus for charging field electrical cables. 4,037,269, Cl. 361-232.000.
Ferguson, Richard; and Troutman, Kenneth W., to Terrell Machine Company, The. Loom bobbin stripper. 4,035,882, Cl. 28-294.000.
Fermi, Rudy: *See—*
Kocsis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David; and Pickard, John, 4,036,133, Cl. 101-415.100.
Fernandez, Carlos M. Cruz; Valdes, Rogelio Rodriguez; and Alberto, Delfin Perez. Harvester combine. 4,035,996, Cl. 56-13.900.
Ferr, Donald H.: *See—*
Holm, LeRoy W.; and Ferr, Donald H., 4,036,300, Cl. 166-273.000.
Ferres, Harry; and Clayton, John Peter, to Beecham Group Limited. Lactonyl esters of penicillins. 4,036,829, Cl. 260-239.100.
Ferro, Armand P., to General Electric Company. Electric field controlled diode with a current controlling surface grid. 4,037,245, Cl. 357-38.000.
Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,035,866, Cl. 16-146.000.
Fiat Societa per Azioni: *See—*
Bigliani, Umberto; and Jacoel, Rafael, 4,036,190, Cl. 123-117.00D.
Fiber Associates, Inc.: *See—*
Geyer, Charles J., Jr.; and White, Ben E., 4,037,039, Cl. 536-60.000.
Fiber Industries, Inc.: *See—*
Bond, Norman John, 4,035,883, Cl. 28-220.000.
Lowder, F. Ray; and Gibbon, John D., 4,036,003, Cl. 57-140.00R.
Fibre-Metal Products Co., The: *See—*
Prince, Jack M.; and Yang, Dai Chung, 4,035,847, Cl. 2-416.000.
Fichtner, Robert L., to Select Energy Systems, Inc. Energy conservation system. 4,037,141, Cl. 361-182.000.
Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., to American Standard, Inc. Plastic laser materials. 4,037,172, Cl. 331-94.50E.
Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, to Sterling Glove Machinery Ltd. Glove turning and blocking process and apparatus. 4,036,415, Cl. 223-40.000.
Filss, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for purifying gases. 4,036,597, Cl. 23-284.000.
Finch, Neville, to Ciba-Geigy Corporation. 5-Sulfinyl-2-pyridinecarboxylic acids. 4,036,965, Cl. 424-266.000.
Finelli, Anthony F., to Goodyear Tire & Rubber Company, The. Cured polyurethane compositions containing epoxy resins. 4,036,906, Cl. 260-830.00P.
Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
Freddi, Tomaso, 4,036,607, Cl. 51-165.00R.
Finn, David S., to Towmotor Corporation. Inching valve with means preventing high pressure inching. 4,036,342, Cl. 192-109.00F.
Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie: *See—*
Schroder, Klaus Dieter, 4,035,864, Cl. 16-35.00R.
Firth, Jack Graham: *See—*
Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592, Cl. 23-232.00E.
Fischer, Albert. Swimming pool brush guide. 4,035,863, Cl. 15-160.000.
Fischer, Artur. Structural element. 4,035,977, Cl. 52-586.000.
Fischer, Paul W.; and Pye, David S., to Union Oil Company of California. Method of foam drilling using a sulfoacetate foaming agent. 4,036,764, Cl. 252-8.50C.
Fischer & Porter Co.: *See—*
Searle, John L., 4,036,052, Cl. 73-194.0EM.
Fishbein, Harry, to Swisstone Corporation. Musical toy. 4,035,948, Cl. 46-189.000.
Fisher, Kenneth J.: *See—*
Brendgord, Thomas; and Fisher, Kenneth J., 4,037,096, Cl. 240-1.400.
Fisons Limited: *See—*
Rutherford, David; Williams, Peter; and Raphael, Richard Anthony, 4,036,983, Cl. 424-295.000.
Fleagle, Joseph E., to Wagner Electric Corporation. Time delayed actuation of wheel slip control system for automotive vehicles and the like. 4,036,537, Cl. 303-106.000.
Fleming, William T., to Walter Kidde & Company, Inc. Remote high temperature indicating apparatus. 4,036,166, Cl. 116-114.500.
Flinth, Rune; and Kjell, Nordstrom, to Transcale AB. Weighing system. 4,036,315, Cl. 177-1.000.
Florczak, Henry. Stand-off arrangement for levels. 4,035,923, Cl. 33-374.000.
Flowers, France. Salad dressing. 4,037,001, Cl. 426-589.000.
Floyd, James R.; Dalenberg, Paul N.; and Slivensky, Robert B., to Wickes Corporation, The. Mechanical seals. 4,036,505, Cl. 277-96.200.
Flymo Societe Anonyme: *See—*
Arnblock, Lennart Oswald, 4,035,995, Cl. 56-11.600.
FMC Corporation: *See—*
Gerlach, Carl J.; and Vande Castle, Jerome, 4,035,984, Cl. 53-28.000.
McClintic, Wayne L.; and Sheetz, Charles E., 4,036,375, Cl. 214-6.00F.
McKeon, John F.; and Lambert, Roy E., 4,036,072, Cl. 74-245.00R.
Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, 4,036,990, Cl. 424-361.000.
Foglio, Maurizio; Franceschi, Giovanni; and Suarato, Antonino, to Societa' Farmaceutici Italia. Process for preparing cephalosporins. 4,036,835, Cl. 260-243.00C.
Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Molding compounds. 4,036,806, Cl. 260-37.00N.
Fond, Loren S.: *See—*
Craig, Burnie M., 4,036,412, Cl. 222-490.000.
Fonderie F. Ili Perani S.p.A.: *See—*
Perani, Giuseppe, 4,036,287, Cl. 165-55.000.
Foner, Simon. Multiple mode magnetometers. 4,037,149, Cl. 324-34.00R.
Food Automation Service Techniques, Inc.: *See—*
Koether, Bernard G.; and Witt, Allan E., 4,036,995, Cl. 426-233.000.
Foote Mineral Company: *See—*
Brown, Patrick M., 4,036,713, Cl. 204-98.000.
Forberich, Helmut: *See—*
Troetscher, Otto; Wiedmann, Erwin; Stahl, Horst; and Forberich, Helmut, 4,036,762, Cl. 250-199.000.
Ford Motor Company: *See—*
Andre, Lee R., 4,036,319, Cl. 188-282.000.
Foret, S. A.: *See—*
Felip Sugranes, Jose, 4,036,583, Cl. 432-117.000.
FORGEAL, societe pour le Forgeage et l'Estampage des Alliages Legers: *See—*
Lucas, Roger; and Auberger, Jacques, 4,035,891, Cl. 29-159.010.
Forman, Wallace: *See—*
Jacobson, Leo; and Forman, Wallace, 4,036,361, Cl. 206-386.000.
Forney Engineering Company: *See—*
Moore, William J., 4,037,113, Cl. 250-554.000.
Forrest, Robert, to Forrest Tool & Die Limited. Lawn aerating attachments for shoes and boots. 4,035,935, Cl. 36-136.000.
Forrest Tool & Die Limited: *See—*
Forrest, Robert, 4,035,935, Cl. 36-136.000.
Forshaw, Sydney James: *See—*
Baines, Eric; Forshaw, Sydney James; and Harvey, Kenneth, 4,036,950, Cl. 424-54.000.
Foseco International Limited: *See—*
Asahara, Hidetoshi, 4,036,282, Cl. 164-123.000.
Washbourne, Colin, 4,036,324, Cl. 181-42.000.
Foster, George B.; and Gibbs, Paul Douglas, to Air Data, Inc: Vertical navigation guidance system. 4,037,086, Cl. 235-150.220.
Foulds, John G., to Bethlehem Steel Corporation. Rolling mill control method and apparatus having operator update of presets. 4,037,087, Cl. 235-151.100.
Fraioli, Anthony V.; and DeRosa, John A., to Minerec Corporation. Oxidation and sinter-resistant metal powders. 4,036,634, Cl. 75-.50A.
Franceschi, Giovanni: *See—*
Foglio, Maurizio; Franceschi, Giovanni; and Suarato, Antonino, 4,036,835, Cl. 260-243.00C.
Francis, Philip L. Air conditioning unit for automobiles. 4,036,029, Cl. 62-243.000.
Francis, Robert Arthur. Pipe joints. 4,036,512, Cl. 285-111.000.
Fravel, John C.: *See—*
Chang, Louis H.; and Fravel, John C., 4,037,216, Cl. 364-900.000.
Freddi, Tomaso, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Method and relevant apparatus to check the rotation of mechanical workpieces being machined on grinders. 4,036,607, Cl. 51-165.00R.
French, Gordon B., to Occidental Oil Shale, Inc. Method of loading blast hole with explosive. 4,036,099, Cl. 86-20.00C.
Fresard, Marcel; Baruffa, Olindo; and Gabriel, Jean-Pierre, to Mefina S.A. Sewing machine. 4,036,158, Cl. 112-258.000.
Frey, Robert L.; and George, Lee R., to P. R. Mallory & Co., Inc. Thrust bushing for variable resistance control. 4,037,188, Cl. 338-174.000.
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Weber, Heinz, 4,036,377, Cl. 214-512.000.
Friedericy, Johan A.; and Towgood, Dennis A., to Garrett Corporation, The. Multi-rim flywheel. 4,036,080, Cl. 74-572.000.
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Priebe, William F., 4,036,664, Cl. 127-69.000.

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Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.

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Tasch, Al F.; and Frye, Robert C., 4,035,906, Cl. 29-578.000.

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Fujimoto, Masaharu: *See—*
Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.

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Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.

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Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.

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Fukuta, Shunji: *See—*
Kato, Hisao; Yagi, Hideo; and Fukuta, Shunji, 4,036,721, Cl. 204-181.000.

Fukuzawa, Kokichi: *See—*
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.

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Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., 4,036,732, Cl. 208-11.0LE.

Funk, Roger Calvin, to Davey Tree Expert Company, The. High analysis fertilizer. 4,036,627, Cl. 71-29.000.

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Yamada, Koichi; Hashimoto, Tadanori; and Furumi, Yoshinori, 4,036,655, Cl. 106-77.000.

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Krimmel, Carl Peter, 4,036,828, Cl. 260-239.0BC.

G P I: *See—*
D'Alessio, Frank P.; and Koenig, Erl A., 4,036,510, Cl. 280-613.000.

G S & H Equipment Corporation: *See—*
Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, 4,035,998, Cl. 56-27.500.

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GAF Corporation: *See—*
Viro, Felix; and Mourning, Michael C., 4,036,643, Cl. 96-29.00D.

Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, to Andco Incorporated. Method and apparatus for electrochemical contaminant removal from liquid media. 4,036,726, Cl. 204-231.000.

Gallagher, James Cyril, to Apsee, Inc. Method and apparatus for generating a negative charge effect in an environment. 4,037,268, Cl. 361-231.000.

Galonska, David A.; McCarthy, James B.; and Rutkiewicz, Joseph A., to General Motors Corporation. Power steering gear with piston nut and screw operatively connected by centralizing root diameter thread. 4,036,110, Cl. 91-375.00A.

Gandy, Dale: *See—*
Gandy, Mack C., 4,036,182, Cl. 123-3.000.

Gandy, Mack C., to Gandy, Dale, a part interest. Gasoline refractionator for internal combustion engines. 4,036,182, Cl. 123-3.000.

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Ganellin, Charon Robin: *See—*
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,036,971, Cl. 424-273.000.

Gangadharan, Tyagaraja: *See—*
Chopra, Gopal Mohan; Gangadharan, Tyagaraja; and Sinha, Ram Narain, 4,036,138, Cl. 102-24.00R.

Ganiaris, Neophytos, to Struthers Patent Corporation. Freezer concentration. 4,036,619, Cl. 62-123.000.

Gardner, Edward Boyd: *See—*
Dobrzanski, John; Gardner, Edward Boyd; and Hart, Ernest V., 4,037,206, Cl. 340-237.00S.

Gardner, Patrick J.; and Myers, Hugh T., Sr. Means for handling hides during and after hide-pulling operation. 4,035,868, Cl. 17-21.000.

Garrett Corporation, The: *See—*
Friedericy, Johan A.; and Towgood, Dennis A., 4,036,080, Cl. 74-572.000.

Garto, Anthony: *See—*
Garto, Joseph Benjamin; and Garto, Anthony, 4,036,497, Cl. 273-101.000.

Garto, Joseph Benjamin; and Garto, Anthony. Amusement apparatus with a ball drop and a rotating receptacle. 4,036,497, Cl. 273-101.000.

Gaskill, George, to I-T-E Imperial Corporation. Replaceable solid state trip unit. 4,037,183, Cl. 335-6.000.

Gaston County Dyeing Machine Company: *See—*
Aurich, Christoph W.; Sturkey, William Cleere; and Turner, James Keith, 4,036,038, Cl. 68-5.00C.

Gasul, Mordecai: *See—*
Boyko, Daniel; Wallach, David; and Gasul, Mordecai, 4,035,900, Cl. 29-795.000.

Gates Rubber Company, The: *See—*
Harder, Steven H., 4,037,077, Cl. 219-123.000.

Cawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, to Dynamit Nobel Aktiengesellschaft and Impex-Essen Vertrieb Von Werkzeugen GmbH. Magazine apparatus for propellant charges and method of making same. 4,036,103, Cl. 89-35.00R.

Gaynor, Edwin S. Two-stage rocker switch for controlling a fluorescent lamp circuit. 4,037,068, Cl. 200-5.00F.

Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung: *See—*
Dellenberg, Hugo, 4,036,308, Cl. 173-75.000.

Gebruder Vieler GmbH: *See—*
Michel, Karl, 4,036,371, Cl. 211-182.000.

Gehrke, Gunter: *See—*
Hederich, Volker; Bien, Hans-Samuel; and Gehrke, Gunter, 4,036,862, Cl. 260-380.000.

Geiger, Hans: *See—*
Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, 4,036,266, Cl. 139-304.000.

Geilhausen, Horst: *See—*
Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, 4,036,952, Cl. 424-89.000.

Geist, Thomas N.: *See—*
Ballas, George C.; and Geist, Thomas N., 4,035,912, Cl. 30-276.000.

Gembicki, Stanley A.; and Aeschbach, Stefan H., to UOP Inc. Method of producing an extruded catalyst composition. 4,036,784, Cl. 252-465.000.

General Atomic Company: *See—*
Cheng, Shih-che; and Kaufman, Jay Stephen, 4,036,289, Cl. 165-82.000.

General Electric Company: *See—*
Bailey, Ronald Barry; and Stitt, Thomas Detlor, 4,037,145, Cl. 318-341.000.
Brennan, Thomas E.; Hartmann, Robert H.; and [illegible]y, Robert M., 4,037,126, Cl. 310-260.000.
Cornell, Richard Henry, 4,036,246, Cl. 137-118.00.
Ferro, Armand P., 4,037,245, Cl. 357-38.000.
Ham, Emmett P.; and Johnson, Albert S., Jr., [illegible]45, Cl. 72-165.000.
Hardman, Bruce Bertolette; and Madigan, William Thomas, 4,036,813, Cl. 260-46.50G.
Herman, Richard M., 4,036,578, Cl. 431-98.000.
Kindig, Alan L., 4,035,910, Cl. 29-628.000.
Klein, Keith W., 4,037,185, Cl. 335-18.000.
Kowach, Ronald A.; and Rowen, William I., 4,036,164, Cl. 115-37.000.
Nicholas, John F., 4,037,163, Cl. 328-175.000.
Nolan, John M., 4,036,344, Cl. 192-48.300.
Owens, Michael; and Neal, Wayne Ray, 4,037,148, Cl. 323-17.000.

General Energy Devices: *See—*
Bouse, Clyde W., 4,036,207, Cl. 126-271.000.

General Foods Corporation: *See—*
Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 4,036,992, Cl. 426-3.000.
Daniels, David, 4,035,988, Cl. 53-183.000.

General Foods Limited: *See—*
Ruff, John, 4,036,998, Cl. 426-302.000.

General Ionex Corporation: *See—*
Purser, Kenneth H., 4,037,100, Cl. 250-281.000.

General Latex and Chemical Corporation: *See—*
Hopkins, Henry S., Jr., 4,036,792, Cl. 260-2.5AW.

General Motors Corporation: *See—*
Benasutti, Louis D.; and Sucro, Jost S., 4,036,620, Cl. 62-338.000.
Bright, James A., 4,036,152, Cl. 110-8.00E.
Galonska, David A.; McCarthy, James B.; and Rutkiewicz, Joseph A., 4,036,110, Cl. 91-375.00A.
McQuinn, Ted M., 4,036,083, Cl. 74-867.000.

Genese, Joseph Nicholas, to Abbott Laboratories. Aspiration device. 4,036,232, Cl. 128-278.000.

Geophysical Systems Corporation: *See*—
Martin, Lincoln A., 4,037,190, Cl. 340-15.5TA.
George, Albert L. Variable speed fan drive system. 4,036,432, Cl. 236-35.000.
George, Brian Victor: *See*—
Rickard, Allan Robert; and George, Brian Victor, 4,036,687, Cl. 176-37.000.
George, Lee R.: *See*—
Frey, Robert L.; and George, Lee R., 4,037,188, Cl. 338-174.000.
Georgia-Pacific Corporation: *See*—
Jespersen, Paul W.; and DeLuca, Raymond F., 4,036,406, Cl. 222-181.000.
Gerdes, Theodor, to Blau KG Fabrik fur Kraftfahrzeugteile. Gas cap with automatic pressure compensation. 4,036,399, Cl. 220-303.000.
Gerendas, Jozsef: *See*—
Wolf, Hans; Gerendas, Jozsef; and Wilhelm, Ernst, 4,036,587, Cl. 8-92.000.
Gergely, Franz Julius. Wall of building blocks and method of constructing it. 4,035,975, Cl. 52-284.000.
Gerlach, Carl J.; and Vande Castle, Jerome, to FMC Corporation. Wrapping method and apparatus. 4,035,984, Cl. 53-28.000.
Gesellschaft fur Kernforschung m.b.H.: *See*—
Weimar, Peter; and Bauer, Franz, 4,036,601, Cl. 428-663.000.
Gesing, Horst: *See*—
Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang; and Messerschmidt, Jurgen, 4,036,485, Cl. 269-285.000.
Getzin, Allan R.: *See*—
Bennett, Robert L.; Parrott, Orville C.; Getzin, Allan R.; and McClain, A. Ervin, 4,036,611, Cl. 55-149.000.
Gevers, Georges A., to Fabrique Nationale Herstal S.A. en abrege FN. Gun barrels. 4,035,944, Cl. 42-75.00B.
Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Inc. Process for continuous xanthation and production of viscose spinning solution. 4,037,039, Cl. 536-60.000.
Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, to Jos. Schneider & Co. Optische Werke Kreuznach. Molding apparatus for making iris leaf. 4,036,571, Cl. 425-556.00R.
GF Business Equipment, Inc.: *See*—
Howk, Victor G., 4,036,525, Cl. 297-353.000.
Ghrist, William D., III: *See*—
Davis, Guy E.; Lardi, Francesco; and Ghrist, William D., III, 4,037,088, Cl. 235-151.210.
Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, to Montedison Fibre S.p.A. Derivatives of quinoline-8-carboxylic acid having pesticidal action. 4,036,963, Cl. 424-258.000.
Gibbon, John D.: *See*—
Lowder, F. Ray; and Gibbon, John D., 4,036,003, Cl. 57-140.00R.
Gibbs, Paul Douglas: *See*—
Foster, George B.; and Gibbs, Paul Douglas, 4,037,086, Cl. 235-150.220.
Gidlof, Lars F. Method and apparatus for use in setting a counter. 4,036,431, Cl. 235-92.0PE.
Giese, John David: *See*—
Sieradzki, Benjamin; and Giese, John David, 4,036,477, Cl. 259-41.000.
Gilbert, Robert B. Encapsulated transmission unit. 4,036,068, Cl. 74-230.17E.
Gilby, Anthony C., to Wilks Scientific Corporation. Method of forming dual mirrors. 4,035,963, Cl. 51-324.000.
Gilford Instrument Laboratories, Inc.: *See*—
Hydo, Steven J., 4,036,064, Cl. 73-425.600.
Gill, Glenn G.: *See*—
Cycowicz, Izchak; and Gill, Glenn G., 4,035,852, Cl. 5-13.000.
Gill, Heather Ann: *See*—
Burge, Malcolm Leonard Ernest; and Gill, Heather Ann, 4,037,000, Cl. 426-572.00J.
Gillard, Claude; and Mauroy, Marcel, to Soram S.A. Automatic electronic apparatus for measuring the bronchial resistance and the elastance of the pulmonary tissue. 4,036,222, Cl. 128-2.080.
Gillemot, George W.: *See*—
Thompson, John T.; and Gillemot, George W., 4,036,546, Cl. 339-95.00R.
Giori, Gualtiero, to De La Rue Giori S.A. Intaglio printing plate manufacture. 4,036,130, Cl. 101-170.000.
Gipson, Robert M.: *See*—
Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., 4,036,880, Cl. 260-570.00D.
Girault, Pierre: *See*—
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Girling Limited: *See*—
Brown, Peter William, 4,036,334, Cl. 188-264.00A.
Gittleman, Jonathan Isaac, to RCA Corporation. Semiconductor absorber for photothermal converter. 4,037,014, Cl. 428-331.000.
GKN Somerset Wire Limited: *See*—
Davies, Peter Gough; Jones, Keith Thomas; and Salmon, Brian, 4,036,046, Cl. 72-286.000.
Glacier Metal Company Limited, The: *See*—
Patel, Padma Ambalal; and Baker, Dennis Stanley, 4,036,822, Cl. 260-79.000.
Glaser, Gunther: *See*—
Effenberger, Hubert; and Seeger, Walter, 4,036,006, Cl. 58-23.00R.
Glass, Benjamin G. Turbine. 4,036,584, Cl. 415-90.000.
Globe-Union Inc.: *See*—
Tiedemann, William H., 4,036,786, Cl. 252-511.000.
Gluck, Walter, to Metallgesellschaft Aktiengesellschaft. Tensioning device for corona-discharge electrodes. 4,035,886, Cl. 29-25.190.
Gmach, John L. T. B.: *See*—
Wyeth, Harold G.; and Gmach, John L. T. B., 4,035,851, Cl. 4-99.000.
Godfrey, William H.; and Woessner, Neal L., to Caterpillar Tractor Co. Securing-unloading apparatus for flatcar carried wheeled vehicles. 4,036,379, Cl. 214-152.000.
Goettsch, Reijer: *See*—
de Rooij, Abraham H.; and Goettsch, Reijer, 4,036,830, Cl. 260-239.30A.
Goldberg, Burton D. Novelty disc manipulating device. 4,036,498, Cl. 273-101.000.
Golden, Martin P.; Tilbrook, Roger W.; and Heylmun, Neal F., to United States of America, Energy Research and Development Administration. Apparatus for controlling molten core debris. 4,036,688, Cl. 176-38.000.
Goldenberg, Marvin M., to Morton-Norwich Products, Inc. Method for treating inflammation. 4,036,981, Cl. 424-285.000.
Golick, Martin Lance. Puzzle game. 4,036,503, Cl. 273-153.00S.
Gomez, Ernesto: *See*—
Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., 4,036,732, Cl. 208-11.0LE.
Gonsior, Leonhard: *See*—
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Gonzalez, Roland; and Miguel, Raul C. Mat switch. 4,037,069, Cl. 200-86.00R.
Goodheim, Harold, to United States of America, Government. Means for applying zinc stearate coatings to the bore surfaces of ferrous alloy tubes. 4,036,170, Cl. 118-73.000.
Goodyear Tire & Rubber Company, The: *See*—
Conger, Marvin T.; and Beers, Roger N., 4,036,765, Cl. 252-21.000.
Finelli, Anthony F., 4,036,906, Cl. 260-830.00P.
Habeck, Bruce W.; and Feeney, George W., 4,037,016, Cl. 428-349.000.
Goof, Sven Karl Lennart. Rod shaped hand-tool. 4,036,311, Cl. 173-169.000.
Gordon, Robert L., to International Paper Company. Expandable package. 4,036,423, Cl. 229-43.000.
Gosney, William Milton, to Texas Instruments Incorporated. Dual injector, floating gate MOS electrically alterable, non-volatile semiconductor memory device. 4,037,242, Cl. 357-23.000.
Goteborgs Analyslaboratorium AB: *See*—
Hulthe, Peter, 4,036,716, Cl. 204-147.000.
Goujon, Roger Hubert; Menard, Jacques Pierre Raymond Raphael; and Pagny, Georges Claude Andre, to Compagnie Honeywell Bull (Societe Anonyme). Power supply testing apparatus. 4,037,156, Cl. 324-158.00R.
Gould, Eugene L. Method of forming decorative inserts in granite and the like. 4,036,929, Cl. 264-132.000.
Gould Inc.: *See*—
Sabatino, Anthony, 4,037,030, Cl. 429-139.000.
Goulet, Roger T., to Cambridge Filter Corporation. Fluid pressure sensing apparatus. 4,036,054, Cl. 73-212.000.
Graf, Peter E.: *See*—
Schmidt, Robert J., deceased; and Graf, Peter E., 4,036,661, Cl. 106-273.00N.
Graham Magnetics Incorporated: *See*—
Deffeyes, Robert J., 4,036,360, Cl. 206-204.000.
Graizzaffi, Carmelo C. Remote control device for key actuated systems. 4,036,040, Cl. 70-431.000.
Gravi-Mechanics Co.: *See*—
Dedolph, Richard R., 4,035,951, Cl. 47-66.000.
Graybiel, Lynn Allan: *See*—
Birney, Richard Eugene; Osborne, William Steese; and Graybiel, Lynn Allan, 4,037,207, Cl. 364-200.000.
Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215, Cl. 364-200.000.
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Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,037,041, Cl. 526-97.000.
Green, Elward Howard, to Newman-Green, Inc. Spray head for nebulization of fluids. 4,036,439, Cl. 239-466.000.
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Microbiocidal capped polymers. 4,036,959, Cl. 424-248.560.
Greene, Janice L., to Standard Oil Company. Process for producing 2-pyrrolidone. 4,036,836, Cl. 260-326.5FN.
Greene, Robert T.: *See*—
Betts, William L.; and Greene, Robert T., 4,037,226, Cl. 340-347.0DD.
Greenwood, Donald L. Pin fastener. 4,036,097, Cl. 85-5.0CP.
Gregg, Gordon E.; Howell, Thomas H.; and Rabins, Leonard, to Honeywell Information Systems, Inc. Matrix multiplier in GF(2^m). 4,037,093, Cl. 235-164.000.
Gregory, Ralph R., to National Upper Cervical Chiropractic Research Association, Inc. Process for determining vertebrae locations in humans. 4,036,213, Cl. 128-2.00S.
Gregory, Reginald, to British Petroleum Company Limited, The. Chemical process producing aromatic hydrocarbons by dehydrocyclodimerization of a C_4 feedstock. 4,036,902, Cl. 260-673.000.
Grehier, Alain; and Cheron, Jacques, to Institut Francais du Petrole. Fuel cells. 4,037,023, Cl. 429-12.000.
Greive, Aloys, to Hamel GmbH Zwirnmaschinen. Yarn twisting apparatus with sound and wind shielding. 4,036,000, Cl. 57-1.00R.

Gresham, Robert W.: *See—*
Cruzen, Harry F.; and Gresham, Robert W., 4,036,570, Cl. 425-141.000.
Gretag Aktiengesellschaft: *See—*
Miloradovic, Predrag; and Schaffhauser, Hans, 4,037,160, Cl. 325-42.000.
Griffith, Russell W., to United Technology Laboratories, Inc. Frequency indicating system. 4,037,152, Cl. 324-79.00R.
Griffiths, James Edward: *See—*
English, John Hershel; Griffiths, James Edward; and Zuk, Paul, 4,037,266, Cl. 361-120.000.
Grinberg, Isaak Pavlovich: *See—*
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Grindstaff, Donald A., to Stauffer Chemical Company. Treatment of whey. 4,036,999, Cl. 426-549.000.
Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, to G S & H Equipment Corporation. Tractor mounted tobacco combine for defoliation and subsequent transportation of tobacco leaves. 4,035,998, Cl. 56-27.500.
Griner, Wade: *See—*
Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, 4,035,998, Cl. 56-27.500.
Grischkowsky, Daniel Richard: *See—*
Bennett, Robert James; and Grischkowsky, Daniel Richard, 4,036,554, Cl. 350-160.00R.
Groeger, Ingo; and Scharbert, Juergen, to Siemens Aktiengesellschaft. Read only memory module. 4,037,218, Cl. 340-173.00R.
Groff, James Wilson. Teaching machine. 4,035,929, Cl. 35-8.00A.
Grolla, Herbert, to Heinrich Wagner Maschinenfabrik. Rail conveyor for foundry molding boxes. 4,036,283, Cl. 164-160.000.
Gruber, Wolfgang: *See—*
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Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, to Lindauer Dornier Gesellschaft mbH. Take-up motion for looms. 4,036,266, Cl. 139-304.000.
GTE Sylvania Incorporated: *See—*
Shaffer, Francis N.; and Mathers, James E., 4,037,110, Cl. 250-483.000.
Zack, Alexander T.; and Gutta, John J., 4,037,129, Cl. 313-201.000.
Guenther, William D., to Dana Corporation. Stratified charge engine. 4,036,184, Cl. 123-75.00B.
Guerrini, Giampaolo, to Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti. Fixing device for a type-carrier disk. 4,036,348, Cl. 197-53.000.
Guild, Charles L. Composite pile having the inside diameter of the tip less than that of the pile and mandrel for driving the same. 4,036,025, Cl. 61-53.720.
Guillais, Jean-Claude: *See—*
Arjalies, Georges; and Guillais, Jean-Claude, 4,036,337, Cl. 191-1.00A.
Guinosso, Charles J.: *See—*
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Guitard, Arthur Herbert: *See—*
Chan, Lock-Lim; and Guitard, Arthur Herbert, 4,036,682, Cl. 162-167.000.
Gulf Research & Development Company: *See—*
Hartle, Robert J., 4,036,605, Cl. 44-68.000.
Readal, Thomas C.; McKinney, Joel D.; and Titmus, Robert A., 4,036,740, Cl. 208-120.000.
Gulf & Western Manufacturing Company (Systems): *See—*
Solomon, Elias E., 4,037,222, Cl. 340-261.000.
Gulotta, Joseph A.: *See—*
Sieger, John S.; and Gulotta, Joseph A., 4,036,626, Cl. 65-182.00R.
Gundersen, Marius, to Vefi A/S. Device for stamping soil into groups of growth pots. 4,036,126, Cl. 100-210.000.
Gundzik, Richard M.; and Logan, Forrest E., to Occidental Petroleum Corporation. Method and apparatus for condensing pyrolysis oils. 4,036,608, Cl. 55-89.000.
Gupta, Rash B., to Westinghouse Electric Corporation. Multiple valve sequential control for a combined cycle power plant. 4,036,011, Cl. 60-39.18B.
Gustafsson, Manfred Wallace: *See—*
Eriksson, Stig-Lennart; and Gustafsson, Manfred Wallace, 4,035,890, Cl. 29-96.000.
Guthrie, James Leverette; and Bach, Donald John, to W. R. Grace & Co. Simulated natural sponge from urethane. 4,036,791, Cl. 260-2.5AG.
Gutta, John J.: *See—*
Zack, Alexander T.; and Gutta, John J., 4,037,129, Cl. 313-201.000.
Guttmann, Friedrich-Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for separating particles from a gas stream. 4,036,612, Cl. 55-282.000.
H.G.C. Construction & Equipment Company, Inc.: *See—*
Ear, Frank P., 4,036,994, Cl. 426-233.000.
H. J. Langen & Sons Ltd.: *See—*
Langen, Christianus Petrus, 4,036,122, Cl. 99-533.000.
Habeck, Bruce W.; and Feeney, George W., to Goodyear Tire & Rubber Company, The. Adhesive composition. 4,037,016, Cl. 428-349.000.
Haber, Edgar, to Massachusetts General Hospital, The. Composition and method for determining the size and location of myocardial infarcts. 4,036,945, Cl. 424-1.000.
Habermann, Clarence E., to Dow Chemical Company, The. Catalysts for the hydration of nitriles of amides. 4,036,879, Cl. 260-561.00N.
Habiger, Cyril W., to Caterpillar Tractor Co. Single lever steering control for hydraulic drive vehicles. 4,036,321, Cl. 180-6.480.
Hack, Helmuth: *See—*
Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 4,036,632, Cl. 71-93.000.
Haemer, Laurence F.: *See—*
Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., 4,036,673, Cl. 156-71.000.
Haferkorn, Herbert: *See—*
Ibing, Gunter; and Haferkorn, Herbert, 4,036,594, Cl. 23-264.000.
Hagezet-Aktiengesellschaft: *See—*
Bieri, Karl, 4,036,121, Cl. 99-289.00R.
Halcour, Kurt: *See—*
Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.
Hale, Robert A.: *See—*
Jones, Vercoe C.; and Hale, Robert A., 4,036,148, Cl. 104-166.000.
Hall, James B.: *See—*
Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,036,397, Cl. 220-268.000.
Hallam, Harry, to A Campton & Sons Company Limited. Wrapping machine. 4,035,990, Cl. 53-222.000.
Haller, Henry E., III: *See—*
Mole, Cecil J.; and Haller, Henry E., III, 4,037,123, Cl. 310-52.000.
Halpern, Alfred; and Sasmor, Ernest J., to Synergistics, Inc. Ultra-violet filtration with certain aminosalicylic acid esters. 4,036,951, Cl. 424-60.000.
Ham, Emmett P.; and Johnson, Albert S., Jr., to General Electric Company. Calibrated adjustable roll straightener for wire. 4,036,045, Cl. 72-165.000.
Hamaker, Weston: *See—*
Allen, Timothy Darrell; and Hamaker, Weston, 4,036,471, Cl. 254-28.000.
Hamel GmbH Zwirnmaschinen: *See—*
Greive, Aloys, 4,036,000, Cl. 57-1.00R.
Hamilton, Edna L., joint tenancy for the estate: *See—*
Hamilton, William I., deceased, 4,036,196, Cl. 123-140.00R.
Hamilton, William I., deceased (by Hamilton, Edna L., joint tenancy for the estate), to Allis-Chalmers Corporation. Spring loaded lever to operate control rack of fuel injector. 4,036,196, Cl. 123-140.00R.
Hammann, Ingeborg: *See—*
Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl. 424-217.000.
Hoffmann, Hellmut; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,036,982, Cl. 424-285.000.
Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, 4,036,956, Cl. 424-210.000.
Hammon, Fritz; Schnell, Georg; and Reimer, Karl-Juergen, to BASF Aktiengesellschaft. Method and equipment for switching the operating conditions of a tape-recorder. 4,037,259, Cl. 360-66.000.
Hannah, Brian: *See—*
Rohrig, Adalbert; Willim, Fritz; and Hannah, Brian, 4,036,280, Cl. 164-82.000.
Hannover, Finn, to Du Pont de Nemours, E. I., and Company. Pipe fitting. 4,036,514, Cl. 285-222.000.
Hansen Manufacturing Co., The: *See—*
Karcher, Thomas D.; and Silagy, Richard J., 4,036,515, Cl. 285-315.000.
Hansen, Ove E.: *See—*
Moller, Jens C. T.; and Hansen, Ove E., 4,036,891, Cl. 260-615.500.
Hanson, Carl V.; and Whitener, Philip C., to Boeing Company, The. Liquid cargo loading apparatus. 4,036,257, Cl. 137-614.060.
Hanson, Richard Eric, to United States of America, Army. Method for determining engine moment of inertia. 4,036,049, Cl. 73-116.000.
Hara, Katsunosuke: *See—*
Majima, Tsuyoshi; and Hara, Katsunosuke, 4,036,753, Cl. 210-63.00R.
Harada, Shunichi: *See—*
Kimura, Hajime; Yoshihara, Takahisa; and Harada, Shunichi, 4,036,600, Cl. 428-555.000.
Harand, Elmar; Richter, Gerd; and Tschopel, Gunter, to Kraftwerk Union Aktiengesellschaft. Primary coolant pump for nuclear reactors. 4,036,561, Cl. 415-18.000.
Harbulak, Edward P., to M & T Chemicals Inc. Electroplating nickel, cobalt, nickel-cobalt alloys and binary or ternary alloys of nickel, cobalt and iron. 4,036,709, Cl. 204-43.00T.
Harder, Steven H., to Gates Rubber Company, The. Battery welding method. 4,037,077, Cl. 219-123.000.
Hardman, Bruce Bertolette; and Madigan, William Thomas, to General Electric Company. Composition for promoting adhesion of curable silicones to substrates. 4,036,813, Cl. 260-46.50G.
Harrington Manufacturing Company: *See—*
Jordan, Bertram L.; Mitchell, John D.; and Sessoms, J. C., Jr., 4,036,454, Cl. 294-5.500.
Harris Corporation: *See—*
Elmore, Donald Fenton, 4,036,131, Cl. 101-247.000.
Martin, Albert R., 4,037,159, Cl. 325-30.000.
Monahan, John F., 4,037,254, Cl. 358-228.000.
Hart, David Frederick: *See—*
Betts, Colin; Collinson, Alfred Edward; and Hart, David Frederick, 4,036,690, Cl. 176-40.000.

Hart, Ernest V.: *See*—
Dobrzanski, John; Gardner, Edward Boyd; and Hart, Ernest V., 4,037,206, Cl. 340-237.00S.
Hartle, Robert J., to Gulf Research & Development Company. Chelates of cerium (IV), their preparation and gasoline containing said chelates. 4,036,605, Cl. 44-68.000.
Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, to Metallgesellschaft Aktiengesellschaft. Semicontinuous process for deodorizing oils. 4,036,865, Cl. 260-428.000.
Hartmann, Robert H.: *See*—
Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,037,126, Cl. 310-260.000.
Hartwick, William F.; and Melcher, Charles H., to Cooper Industries, Inc. Fluid compressor valve. 4,036,251, Cl. 137-512.100.
Harvey, Kenneth: *See*—
Baines, Eric; Forshaw, Sydney James; and Harvey, Kenneth, 4,036,950, Cl. 424-54.000.
Harvey, Peter, to MacPherson Powders Limited. Apparatus for coating articles. 4,036,169, Cl. 118-66.000.
Harvey, Ronald William Stanley, to A. R. I. Propaflor Limited. Raised floor panels. 4,035,967, Cl. 52-126.000.
Harvey, William R., to Lexsuco, Inc. Roofing nail applicator. 4,036,422, Cl. 227-110.000.
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased (Kinjo, legal representative; by Ayako), to Canon Kabushiki Kaisha. Heat developable photosensitive material containing compounds of sulfur. 4,036,650, Cl. 96-114.100.
Hashimoto, Masashi: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.
Hashimoto, Shigeki: *See*—
Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
Hashimoto, Tadanori: *See*—
Yamada, Koichi; Hashimoto, Tadanori; and Furumi, Yoshinori, 4,036,655, Cl. 106-77.000.
Haslett, Glen M.; and Boggs, Roger L., to Caterpillar Tractor Co. Track shoe back-bend bumper. 4,036,538, Cl. 305-47.000.
Hastings, Kingsley N. Automatic gain control amplifier. 4,037,167, Cl. 330-29.000.
Hata, Yoshitaka; Shioyama, Giichi; and Minami, Hidehiro, to Nissan Motor Co., Ltd. Multi-cylinder internal combustion engine. 4,036,015, Cl. 60-282.000.
Hatakeyama, Junichi: *See*—
Matsumoto, Kuniaki; Hatakeyama, Junichi; and Okamoto, Masaharu, 4,036,023, Cl. 61-25.000.
Hatch, Ronald Frank, to St. Regis-Aci Pty. Limited. Sack making equipment. 4,036,115, Cl. 93-8.00R.
Hatebur Umformmaschinen AG: *See*—
Criblez, Roger, 4,036,089, Cl. 83-198.000.
Hathaway, Lucille. Drainage device for ear irrigation. 4,036,235, Cl. 128-292.000.
Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., to Dart Industries Inc. Glass fiber reinforced thermoplastic composition and process for its preparation. 4,037,011, Cl. 428-294.000.
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, to Nippon Soken, Inc. Air-fuel mixture ratio correcting system for carburetor. 4,036,186, Cl. 123-32.0EA.
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., to Service Equipment Design Co., Inc. Thread protector for oil-well pipe and bladder incorporated therein. 4,036,261, Cl. 138-96.00T.
Hauk, Thomas D.: *See*—
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,036,261, Cl. 138-96.00T.
Hauni-Werke Korber & Co., KG: *See*—
Schubert, Bernhard; and Blidung, Otto, 4,036,119, Cl. 93-77.0FT.
Haury, Donald Richard: *See*—
Carey, Charles Henry; and Haury, Donald Richard, 4,036,448, Cl. 242-81.000.
Hauserman, Inc.: *See*—
Courtwright, Robert M., 4,036,542, Cl. 312-330.00R.
Havas, George, to Ajax Magnethermic Corporation. Power control system for single phase induction melting or heating furnace. 4,037,044, Cl. 13-26.000.
Hawera probst Kommanditgesellschaft Hartmetall-Werkzeugfabric Ravensburgh: *See*—
Kieferle, Wolfgang, 4,036,482, Cl. 266-252.000.
Hawker Siddeley Dynamics Limited: *See*—
Stephenson, Peter Robert Norman, 4,036,763, Cl. 250-214.00C.
Hawryluk, John. Liquid fuel mixing device. 4,036,914, Cl. 261-79.00R.
Hawthorne, Arthur L.; and Hazen, David R., to Continental Oil Company. Support system for a unitized pair of auger conveyors. 4,036,529, Cl. 299-19.000.
Hay, Donald A. Building construction system. 4,035,971, Cl. 52-236.600.
Hayakawa, Shigeru: *See*—
Ono, Shusuke; Wasa, Kiyotaka; and Hayakawa, Shigeru, 4,037,176, Cl. 333-30.00R.
Hayamizu, Yoshisada: *See*—
Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl. 128-4.000.
Hayashi, Kenji: *See*—
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,036,186, Cl. 123-32.0EA.
Hayashi, Tsutomu; Kawaguchi, Takeshi; and Maeda, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle anti-skid brake control apparatus. 4,036,331, Cl. 188-187.000.
Hayes International Corporation: *See*—
Pearson, Walter B., 4,037,228, Cl. 343-18.00C.
Hayes, John C.: *See*—
Pollitzer, Ernest L.; and Hayes, John C., 4,036,741, Cl. 208-139.000.
Hayes, Robert William, to Hayes-Te Equipment Corporation. Fireplace stove. 4,036,205, Cl. 126-126.000.
Hayes-Te Equipment Corporation: *See*—
Hayes, Robert William, 4,036,205, Cl. 126-126.000.
Hayes, Thomas H. Basketball game device. 4,036,494, Cl. 273-1.50R.
Hazen, David R.: *See*—
Hawthorne, Arthur L.; and Hazen, David R., 4,036,529, Cl. 299-19.000.
Heath, Roy T.: *See*—
Perry, Eric; Heath, Roy T.; Rost, Lee F.; and Cowan, Braughler, 4,036,382, Cl. 214-313.000.
Hederich, Volker; Bien, Hans-Samuel; and Gehrke, Gunter, to Bayer Aktiengesellschaft. 1-Amino-2-(bromophenoxy-alkoxy)-4-hydroxy anthraquinone dyestuffs. 4,036,862, Cl. 260-380.000.
Hedman, Bengt, to Bergvik och Ala Aktiebolag. Studded chain link. 4,036,010, Cl. 59-84.000.
Heimann GmbH: *See*—
Hoene, Ernst-Ludwig, 4,037,136, Cl. 315-241.00P.
Heimlicher, Paul; and Von Hein, Eduard, to Maschinenfabrik Wifag. Sheet folding apparatus. 4,036,487, Cl. 270-71.000.
Heinrich Wagner Maschinenfabrik: *See*—
Grolla, Herbert, 4,036,283, Cl. 164-160.000.
Heintzelman, Leo. Mist separator. 4,036,615, Cl. 55-442.000.
Heitmann, Wilhelm: *See*—
Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for the automatic analysis of the concentration of an individual component of a fluid in a metal-depositing bath having several components. 4,036,590, Cl. 23-230.00R.
Hellkvist, John William, to AB Stathmos. Apparatus for measuring loads. 4,036,317, Cl. 177-209.000.
Hellmig, Ehrhard; and Ranz, Erwin, to AGFA-Gevaert, A.G. Color correction of unwanted side densities in light-sensitive color photographic elements. 4,036,646, Cl. 96-74.000.
Hemmi, Keiji: *See*—
Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, 4,036,948, Cl. 424-32.000.
Henderson, Eldon V. Wheels and assembly for a boat. 4,036,507, Cl. 280-414.00A.
Henkel & Cie G.m.b.H.: *See*—
Trautvetter, Jutta; Weingartz, Albert; and Werner, Lothar, 4,036,775, Cl. 252-134.000.
Henning, Dale A.; and Rainbolt, Jack D., to B. F. Goodrich Company, The. Disc brake. 4,036,330, Cl. 188-72.800.
Henninger, Peter: *See*—
Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, 4,037,124, Cl. 310-52.000.
Hensel, Paul Christopher; and Spiers, Ronald Geoffrey, to Post Office, The. Severing apparatus. 4,036,419, Cl. 225-96.500.
Hephner, Marie K.: *See*—
Stambaugh, Sherwood C.; and Hephner, Marie K., 4,036,367, Cl. 211-37.000.
Hercules Incorporated: *See*—
Hurley, Eldon Kenneth, 4,036,100, Cl. 86-20.00C.
Maslanka, William Walter, 4,037,017, Cl. 428-413.000.
Herman, Richard M., to General Electric Company. Photoflash array and method of construction. 4,036,578, Cl. 431-98.000.
Hertel, Karl. Cutting tools. 4,035,887, Cl. 29-95.00R.
Herwig, Walter: *See*—
Noetzel, Siegfried; and Herwig, Walter, 4,036,811, Cl. 260-45.75W.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. 4,036,832, Cl. 260-240.00R.
Hesse, Robert Henry: *See*—
Barton, Derek Harold Richard; and Hesse, Robert Henry, 4,036,864, Cl. 260-397.300.
Hewlett-Packard Company: *See*—
Osborne, Thomas E.; and Stockwell, Richard Kent, 4,037,092, Cl. 235-156.000.
Takeuchi, Yasuhito, 4,037,151, Cl. 324-78.00R.
Heye, Hermann: *See*—
Schaar, Lothar, 4,036,094, Cl. 83-623.000.
Heylmun, Neal F.: *See*—
Golden, Martin P.; Tilbrook, Roger W.; and Heylmun, Neal F., 4,036,688, Cl. 176-38.000.
Hijikata, Akiko: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.
Hill, Monty B., to Zenith Radio Corporation. Implosion protection system for color CRT bulb having a bonded funnel frame. 4,037,255, Cl. 358-246.000.
Hills, William H.; and Borgman, Milton H., to Carisbrook Industries Inc. Apparatus for drawing and crimping yarn. 4,035,880, Cl. 28-220.000.
Hillsman, Deane; Cook, Albert M.; and Simes, James G., to Sutter

Hospitals Medical Research Foundation. Respirator. 4,036,221, Cl. 128-145.600.
Hilmoine, Serge: *See*—
Couderc, Pierre; and Hilmoine, Serge, 4,036,888, Cl. 260-602.000.
Hilti Aktiengesellschaft: *See*—
Storck, Friedrich; Kunesch, Rudolf; and Missbach, Gernot, 4,036,460, Cl. 248-59.000.
Himi, Hitoshi, to Kabushiki Kaisha Meidensha. Metal clad insulating circuit breaker. 4,037,187, Cl. 337-121.000.
Himmelsbach, Paul: *See*—
Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, 4,036,571, Cl. 425-556.00R.
Hine, Louis P., Jr., to Westinghouse Electric Corporation. Refrigeration condenser. 4,036,292, Cl. 165-122.000.
Hintze, Rudolf. Air conditioning apparatus and method for making the same, particularly for automotive vehicles. 4,035,894, Cl. 29-157.30R.
Hirai, Seizaburo; Mizoe, Yoji; and Koji, Itoh, to Nippon Paint Co., Ltd. Adhesive composition. 4,036,804, Cl. 260-29.7SQ.
Hirose, Kazuhiro: *See*—
Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl. 58-85.500.
Hitachi, Ltd.: *See*—
Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, 4,036,041, Cl. 72-8.000.
Ienaka, Masanori; and Suzuki, Yukio, 4,037,056, Cl. 179-15.0BT.
Kobayashi, Sadao, 4,036,672, Cl. 148-175.000.
Koike, Keiichi; and Sasaki, Toshimi, 4,037,015, Cl. 428-331.000.
Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, 4,036,042, Cl. 72-9.000.
Matsumoto, Kuniaki; Hatakeyama, Junichi; and Okamoto, Masaharu, 4,036,023, Cl. 61-25.000.
Minorikawa, Kazuo, 4,037,085, Cl. 235-92.0LG.
Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,037,036, Cl. 526-46.000.
Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, 4,037,212, Cl. 364-200.000.
Takata, Yoshinori, 4,036,704, Cl. 204-1.00T.
Hochtemperatur-Reactorbau GmbH: *See*—
Baumgaertner, Heinrich, 4,036,689, Cl. 176-39.000.
Hochtemperatur-Reaktorbau GmbH: *See*—
Ecker, Hans, 4,036,294, Cl. 165-154.000.
Hochwalt, John R., to United States of America, Air Force. Protective flight helmet. 4,035,845, Cl. 2-6.000.
Hodama, Takuo, to SBE Incorporated. Up/down switch and switching signal generator. 4,037,116, Cl. 307-247.00A.
Hoechst Aktiengesellschaft: *See*—
Fuchs, Hermann; and Meininger, Fritz, 4,036,825, Cl. 260-196.000.
Mitzlaff, Michael, 4,036,712, Cl. 204-59.00R.
Noetzel, Siegfried; and Herwig, Walter, 4,036,811, Cl. 260-45.75W.
Hoeg, Joseph G. Ultra-high pressure vessel electrical pass-through connector. 4,037,046, Cl. 174-18.000.
Hoene, Ernst-Ludwig, to Heimann GmbH. Circuit arrangement for igniting at least one gas discharge flash lamp. 4,037,136, Cl. 315-241.00P.
Hofberger, Gerald F.: *See*—
Loftus, Edward J.; and Hofberger, Gerald F., 4,036,513, Cl. 285-179.000.
Hofer, Kurt: *See*—
Avar, Lajos; and Hofer, Kurt, 4,036,812, Cl. 260-45.75N.
Hoff, Ivar. Garage door assemblies. 4,035,954, Cl. 49-203.000.
Hoff, Stephen J., to Hoffco, Inc. Lawn mower blade control apparatus. 4,035,994, Cl. 56-11.300.
Hoffco, Inc.: *See*—
Hoff, Stephen J., 4,035,994, Cl. 56-11.300.
Hoffman, Charles R.; and Powell, Michael W., to Motorola, Inc. Junction breakdown memory cells. 4,037,243, Cl. 357-23.000.
Hoffman, Neil R.; and Jansen, Johannes H., to Brake Engineering, Inc. Disc brake apparatus suitable for bicycles. 4,036,328, Cl. 188-26.000.
Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-Alkyl-N-substituted-S-halophenoxymethyl-dithiophosphoric acid ester-amides. 4,036,947, Cl. 424-217.000.
Hoffmann, Hellmut; Riebel, Hans-Jochem; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-Alkyl-S-alkyl-O-[2-carbalkoxy-benzofuran(3)yl]-thionothiol-phosphoric acid esters. 4,036,982, Cl. 424-285.000.
Hoffmann-La Roche Inc.: *See*—
Alig, Leo; Furst, Andor; and Muller, Marcel, 4,036,874, Cl. 260-488.00B.
Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,036,871, Cl. 260-468.00D.
Hoffmann, Lawrence C., Jr.: *See*—
Gane, Gordon R.; and Hoffmann, Lawrence C., Jr., 4,036,159, Cl. 113-1.00F.
Hoffmann, Rudolf. Continuous casting apparatus for slabs. 4,036,284, Cl. 164-280.000.
Hogland, Gerald Hugh: *See*—
Reba, Imants; Hogland, Gerald Hugh; and Wolthausen, Edward Clair, 4,035,870, Cl. 19-155.000.
Hokkaido Sugar Co., Ltd.: *See*—
Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
Hokuetsu Kogyo Co., Ltd.: *See*—
Sato, Goro, 4,036,567, Cl. 418-105.000.
Holben, Eugene F.: *See*—
Bublitz, Arthur T.; and Holben, Eugene F., 4,036,256, Cl. 137-595.000.
Holland, George William; Jernow, Jane Liu; and Rosen, Perry, to Hoffmann-La Roche Inc. 11-Substituted prostaglandins. 4,036,871, Cl. 260-468.00D.
Hollis and Company: *See*—
McKnight, Oliver R.; and Seaman, William M., Jr., 4,036,071, Cl. 74-243.00R.
Holm, LeRoy W.; and Ferr, Donald H., to Union Oil Company of California. Micellar flooding process. 4,036,300, Cl. 166-273.000.
Holman, George B.: *See*—
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,036,301, Cl. 166-293.000.
Holmes, Charles Chamberlain; Skinner, Wallace; and Mattocks, George Roland, to Elemelt Limited. Method of and furnace for batch charging into a glass melting furnace. 4,036,625, Cl. 65-134.000.
Holton, Harry Hutchinson; and Segall, Gordon Hart, to Canadian Industries, Ltd. Delignification of lignocellulosic material with a soda pulping liquor containing a Diels Alder adduct of benzoquinone or naphthoquinone in admixture with a nitro aromatic compound. 4,036,680, Cl. 162-65.000.
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Hayashi, Tsutomu; Kawaguchi, Takeshi; and Maeda, Noriyuki, 4,036,331, Cl. 188-187.000.
Honda, Takeo; and Matsushima, Hisatomo, to Victor Company of Japan, Limited. Wire connector. 4,036,549, Cl. 339-275.00R.
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Gregg, Gordon E.; Howell, Thomas H.; and Rabins, Leonard, 4,037,093, Cl. 235-164.000.
Honma, Keisuke: *See*—
Nakazato, Tetsuo; Kamon, Shunji; Tokuda, Koichi; and Honma, Keisuke, 4,035,987, Cl. 53-133.000.
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Morlet, Jean G.; Honnorat, Yves C.; and Raisson, Gerard D., 4,036,568, Cl. 425-8.000.
Hood, Robert Allen: *See*—
Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, 4,037,214, Cl. 364-200.000.
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Hoogvelt, Roy; and Hoogvelt, Jack, 4,036,398, Cl. 220-270.000.
Hoogvelt, Roy; and Hoogvelt, Jack, to Raymond Lee Organization, Inc., The, a part interest. Container with removable ring and utensil carrying lid. 4,036,398, Cl. 220-270.000.
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Hopkins, George C.; and Merrifield, D. Bruce, 4,036,810, Cl. 260-45.75W.
Hoover, Alan W., to International Telephone and Telegraph Corporation. Image tube power supply. 4,037,132, Cl. 315-10.000.
Hopkins, George C.; and Merrifield, D. Bruce, to Hooker Chemicals & Plastics Corporation. Halogen containing polymeric resins having heat and light stability. 4,036,810, Cl. 260-45.75W.
Hopkins, Henry S., Jr., to General Latex and Chemical Corporation. Polyisocyanurate foams prepared by a cocatalyst system. 4,036,792, Cl. 260-2.5AW.
Hopkins, Jeffrey E.; and Bennett, Bobby B., to Hopkins, Jeffrey E. Paint can and brush receptacle. 4,036,463, Cl. 248-210.000.
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Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, to Dynamit Nobel Aktiengesellschaft. Hardenable compositions of improved thermal stability. 4,036,798, Cl. 260-28.00P.
Hori, Masatake; and Kikuchi, Shintaro, to Takeda Chemical Industries, Ltd. Adsorbent for recycling artificial kidney. 4,036,747, Cl. 210-22.00A.
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Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, 4,036,265, Cl. 139-190.000.
Horne, Charles E.: *See*—
Barnes, Gerald O.; and Horne, Charles E., 4,036,403, Cl. 222-23.000.
Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Integrated programmable logic array. 4,037,089, Cl. 235-152.000.
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Houlihan, William J., to Sandoz, Inc. Phthalides and process for preparing same. 4,036,855, Cl. 260-343.30R.
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Hovnanian, John. Board game apparatus. 4,036,501, Cl. 273-131.00K.
Howard, Homer E. Ignition system with programmable dwell. 4,036,198, Cl. 123-146.50A.
Howell, Thomas H.: *See*—
Gregg, Gordon E.; Howell, Thomas H.; and Rabins, Leonard, 4,037,093, Cl. 235-164.000.
Howells, Edward Morris; and Chan, Cheung Yun, to Broken Hill Proprietary Company Limited, The. Signal stabilizing circuits. 4,037,095, Cl. 235-183.000.
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Howk, Victor G., to GF Business Equipment, Inc. Backrest adjustment mechanism. 4,036,525, Cl. 297-353.000.
Hoyle, John A.; Humphris, Robert R.; and Boring, John W., to University of Virginia. Thin-film superconductor device. 4,037,102, Cl. 250-336.000.
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Hrivnak, Andrew N. Assembly spike for athletic shoe. 4,035,934, Cl. 36-67.00D.
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Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,037,186, Cl. 335-206.000.
Huber, Joseph B.; and Brown, Thomas A., to Kennametal Inc. Arrangement for shearing blades with cemented hard carbide inserts. 4,036,095, Cl. 83-674.000.
Hubschmann, Karl-Wolfgang, to Motoren-Werke Mannheim AG. Rolling diaphragm sealing devices. 4,036,112, Cl. 92-80.000.
Huckfeldt, Gebhard R. Knitted textile casing for sausages. 4,036,037, Cl. 66-170.000.
Huddle, Carl F., to Tension Structures Co. Vertical arch shelter. 4,036,244, Cl. 135-4.00R.
Hufendiek, Ernst-Wilhelm, to Daimler-Benz Aktiengesellschaft. Commercial vehicle driven by an injection internal combustion engine having a transmission with hydrodynamic coupling or with a hydrodynamic torque converter. 4,036,340, Cl. 192-.084.
Huffman, Clarence W., to IMC Chemical Group, Inc. Preparation of alkyl substituted o-hydroxybenzoic acid esters. 4,036,873, Cl. 260-473.00S.
Hughes Aircraft Company: *See*—
Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.
Burnett, Gary L.; and Tsuda, George I., 4,037,182, Cl. 333-73.00R.
Keller, Leon Brian; and Kelchner, Raymond E., Jr., 4,037,010, Cl. 428-290.000.
Hujita, Masami: *See*—
Igashira, Toshihiko; Yamaguchi, Shunzo; and Hujita, Masami, 4,036,183, Cl. 123-8.130.
Hukui, Koichiro: *See*—
Ishi, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu, 4,035,908, Cl. 29-597.000.
Hulthe, Peter, to Goteborgs Analyslaboratorium AB. Method to prevent the formation of incrustations on working electrodes in electrode steam generators or the like and a means for performing the method. 4,036,716, Cl. 204-147.000.
Humber, Leslie G.: *See*—
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Hoyle, John A.; Humphris, Robert R.; and Boring, John W., 4,037,102, Cl. 250-336.000.
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Hunt, Edward F.: *See*—
Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., 4,035,983, Cl. 53-28.000.
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Ullman, John E., 4,036,362, Cl. 206-432.000.
Huppi, Xaver Johann, to Elex A.G. Rapping shaft drive assembly for electrostatic precipitators. 4,036,610, Cl. 55-112.000.
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Huron, Marie-Jose; Jacquin, Yves; and Renault, Philippe, to Institut Francais du Petrole. Process for removing sulfur dioxide from a gas and producing sulfur therefrom. 4,036,943, Cl. 423-576.000.
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Bohmer, Eberhard; and Husch, Wilhelm, 4,036,483, Cl. 266-281.000.
Hyars, Claude: *See*—
Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, 4,035,998, Cl. 56-27.500.
Hyatt, Gilbert Peter: *See*—
Lee, Barry Thomas; and Hyatt, Gilbert Peter, 4,036,178, Cl. 119-51.00R.
HYCALOG Inc.: *See*—
DeLuish, Kenneth R., 4,036,312, Cl. 175-302.000.
Hydaroll Limited: *See*—
Webb, John Edmund Richard, 4,036,345, Cl. 193-35.0SS.
Hydo, Steven J., to Gilford Instrument Laboratories, Inc. Pipette device. 4,036,064, Cl. 73-425.600.
Hydril Company: *See*—
Mott, James D.; and Miyagishima, Tosh, 4,036,296, Cl. 166-322.000.
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Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,036,996, Cl. 426-254.000.
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Gaskill, George, 4,037,183, Cl. 335-6.000.
Kempisty, Francis W., Jr.; and Lundgren, John L., 4,037,184, Cl. 335-6.000.
Ibing, Gunter; and Haferkorn, Herbert, to veba-Chemie AG. Apparatus for recovering higher melting organic materials via fractional sublimation. 4,036,594, Cl. 23-264.000.
Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, to Hitachi, Ltd. Gage control system for rolling mill. 4,036,041, Cl. 72-8.000.
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O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., 4,036,840, Cl. 260-256.50R.
Ide, Allan R. Cargo transport system. 4,036,376, Cl. 214-14.000.
Ide, Hideaki: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000.
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Ienaka, Masanori; and Suzuki, Yukio, to Hitachi, Ltd. FM multiplex demodulator circuit. 4,037,056, Cl. 179-15.0BT.
Ifuku, Tetsuhiko: *See*—
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.
Igashira, Toshihiko; Yamaguchi, Shunzo; and Hujita, Masami, to Nippon Soken, Inc. Rotary piston engine. 4,036,183, Cl. 123-8.130.
Iijima, Hiroshi: *See*—
Aoyama, Kozo; Iijima, Hiroshi; and Kikuchi, Shizuo, 4,035,985, Cl. 53-30.00R.
Iijima, Yukihiko; and Ishiguro, Tatsuo, to Nippon Electric Company Limited. System for coding and/or decoding color television signal including luminance and chrominance information. 4,037,248, Cl. 358-13.000.
Iio, Akira: *See*—
Kawakami, Masato; Andoh, Naoki; Iio, Akira; and Yamanouchi, Haruo, 4,036,901, Cl. 260-669.00R.
Ikeda, Hiroshi: *See*—
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Ikeda, Isumi; and Takasaki, Takashi, to Tensei Suisan Company, Limited. Process for preparation of fish meat extracts. 4,036,993, Cl. 426-7.000.
Ikuta, Hiroaki; Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, to Panafacom Limited. Address extending control unit. 4,037,211, Cl. 364-200.000.
Iles, Roger F.: *See*—
Brook, Greville B.; Brooks, Peter L.; and Iles, Roger F., 4,036,669, Cl. 148-11.50C.
Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich; Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich. Rotor for a centrifuge. 4,036,425, Cl. 233-2.000.
Illing, Henry, to Kieley & Mueller, Inc. Cantilevered ball valve. 4,036,470, Cl. 251-309.000.
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Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
Imai, Toshihiro: *See*—
Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl. 128-4.000.
IMC Chemical Group, Inc.: *See*—
Huffman, Clarence W., 4,036,873, Cl. 260-473.00S.
Imperial Chemical Industries Limited: *See*—
Atherton, John Heathcote, 4,036,807, Cl. 260-42.150.
Atherton, John Heathcote, 4,036,868, Cl. 260-448.20N.
Brown, Michael Trevenen; and Rodway, William George, 4,036,718, Cl. 204-159.200.
Crosby, John; Rennie, Robert Allan Campbell; and Paton, Robert Michael, 4,036,869, Cl. 260-453.0AP.
Feasey, Ronald George; and Rose, John Brewster, 4,036,815, Cl. 260-49.000.
Imperial Metal Industries (Kynoch) Limited: *See*—
Jacob, William Robin, 4,037,031, Cl. 429-149.000.
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, to Kao Soap Co., Ltd. 4-Exo-hydroxy-endo-tricyclo [5.2.2.$0^{2,6}$]undec-8-ene. 4,036,892, Cl. 260-617.00F.
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Takaishi, Naotake, to Kao Soap Co., Ltd. 8-Exo-hydroxy-endo-tricyclo [5.2.2.0^{2,6}]undecane. 4,036,893, Cl. 260-617.00F.

Indian Explosives Limited: *See—*
Chopra, Gopal Mohan; Gangadharan, Tyagaraja; and Sinha, Ram Narain, 4,036,138, Cl. 102-24.00R.

Indian Head Inc.: *See—*
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Inficon Leybold-Heraeus Inc.: *See—*
Lu, Chih-shun, 4,036,167, Cl. 118-7.000.

Inflo Systems, Inc.: *See—*
Rich, Donald S., 4,036,827, Cl. 200-209.000.

Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti: *See—*
Guerrini, Giampaolo, 4,036,348, Cl. 197-53.000.

Inhalation Therapy Equipment, Inc.: *See—*
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Inoue, Atushi: *See—*
Ieki, Hideharu; Ishiyama, Hideki; and Inoue, Atushi, 4,037,181, Cl. 333-72.000.

Inoue, Norikatsu: *See—*
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Institut Francais du Petrole: *See—*
Cheron, Jacques, 4,037,022, Cl. 429-10.000.
Denis, Jacques; and Parc, Guy, 4,036,771, Cl. 252-56.00R.
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Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.

Intel Corporation: *See—*
Yih, James Shou-Chen, 4,036,550, Cl. 350-160.0LC.

Interface Mechanisms, Inc.: *See—*
Ellefson, Larry P., 4,036,132, Cl. 101-288.000.

International Business Machines Corporation: *See—*
Atkins, James Damon; Murphy, Charles Allen; and Stotts, Lewis Everett, 4,037,213, Cl. 364-200.000.
Barkley, John Allen; Robinson, Neil Lloyd; and Shelledy, Frank Boyd, 4,037,264, Cl. 360-129.000.
Bennett, Robert James; and Grischkowsky, Daniel Richard, 4,036,554, Cl. 350-160.00R.
Birney, Richard Eugene; Osborne, William Steese; and Graybiel, Lynn Allan, 4,037,207, Cl. 364-200.000.
Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, 4,037,214, Cl. 364-200.000.
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Bonner, Gilbert Belmont; and Dessel, Joseph Leo, 4,037,122, Cl. 310-14.000.
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,036,648, Cl. 96-90.00R.
Kaplan, Leon H.; Lounsbury, John Baldwin; and Zimmerman, Steven Michael, 4,036,644, Cl. 96-36.000.
Knight, Arthur Holt; and Underhill, Thomas Travis, 4,036,556, Cl. 355-14.000.
Nielsen, Thomas Christian; and Sirico, James Louis, 4,036,381, Cl. 214-310.000.
Schwartz, Bradford Clyde; Silkensen, Ralph Donald; and Steving, Gerald, 4,036,723, Cl. 204-192.0EC.

International Flavors & Fragrances Inc.: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886, Cl. 260-599.000.
van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., 4,036,774, Cl. 252-132.000.

International Harvester Company: *See—*
Anderson, John C., 4,036,076, Cl. 74-409.000.

International Paper Company: *See—*
Gordon, Robert L., 4,036,423, Cl. 229-43.000.

International Research and Development Company Limited: *See—*
Pinder, Russell Stuart; and Clark, Leslie, 4,036,645, Cl. 136-89.00C.

International Standard Electric Corporation: *See—*
Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, 4,037,120, Cl. 307-311.000.

International Telephone and Telegraph Corporation: *See—*
Hoover, Alan W., 4,037,132, Cl. 315-10.000.
Scherrer, Raymond E., 4,036,706, Cl. 204-15.000.
Stine, Robert David, 4,037,058, Cl. 179-99.000.
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Interx Research Corporation: *See—*
Bodor, Nicolae S.; and Sloan, Kenneth B., 4,036,845, Cl. 260-295.00L.
Kaminski, James J.; and Bodor, Nicolae S., 4,036,843, Cl. 260-294.80R.

Intichar, Lutz: *See—*
Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, 4,037,124, Cl. 310-52.000.

Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., to Exxon Research and Engineering Company. Tar sands extraction process. 4,036,732, Cl. 208-11.0LE.

Irion, Eckart: *See—*
Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, 4,036,952, Cl. 424-89.000.

Isaka, Ichiro: *See—*
Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.

Ishi, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu, to Sony Corporation. Method of manufacturing electric motor commutator. 4,035,908, Cl. 29-597.000.

Ishida, Akinori: *See—*
Ito, Ayao; and Ishida, Akinori, 4,036,217, Cl. 128-2.080.

Ishiguro, Tatsuo: *See—*
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Ishii, Ko; and Yoshida, Tadamasa, to Sumitomo Bakelite Company, Limited. Adhesive comprising post-chlorinated polyethylene and polyvinyl chloride. 4,037,020, Cl. 428-518.000.

Ishimaru, Toshiyasu; and Kawabata, Mariko. 7-[(5'-N-methylthioacetamido)-adipoamido] cephalosporin derivatives. 4,036,833, Cl. 260-243.00C.

Ishiyama, Hideki: *See—*
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Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, to Kabushiki Kaisha Komatsu Seisakusho. Automatic article working system. 4,035,904, Cl. 29-563.000.

Ishizuka, Haruo. Diaper supplement insert. 4,036,234, Cl. 128-287.000.

Ito, Ayao; and Ishida, Akinori, to Tokyo Shibaura Electric Co., Ltd. Device for measuring a respired amount of air. 4,036,217, Cl. 128-2.080.

Ito, Fumio: *See—*
Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233, Cl. 354-23.00D.

Ito, Muneo: *See—*
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Ito, Tadashi: *See—*
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Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, to Ito, Yasuro; and Taisei Corporation. Method and apparatus for moulding hydraulic cement or the like material. 4,036,922, Cl. 264-35.000.

ITT Industries, Inc.: *See—*
Schat, Hermannus, 4,037,119, Cl. 307-293.000.

Ivin, Jury Filoretovich; Levischev, Arkady Nikolaevich; and Sokolov, Vasily Ivanovich. Bowl of centrifugal separator. 4,036,429, Cl. 233-27.000.

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Iwanami, Masaru: *See—*
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Iwasawa, Yoshihiro: *See—*
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Iwata, Akiyoshi: *See—*
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Iwata, Toshiharu: *See—*
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J. M. Huber Corporation: *See—*
Williams, Lloyd E.; and Almagro, Guillermo A., 4,036,663, Cl. 106-308.00B.

J. R. Schneider Co., Inc.: *See—*
King, Robert Daniel, 4,036,589, Cl. 23-230.00B.

J. R. Short Milling Co.: *See—*
Woonton, Kent; Short, Jeffrey R., III; and Roach, Kenneth N., 4,036,277, Cl. 164-16.000.

Jackson, Byron L.: *See—*
Wagner, Joseph P.; and Jackson, Byron L., 4,036,433, Cl. 236-100.000.

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Jacobson, Howard Wayne, to Du Pont de Nemours, E. I., and Company. Amorphous silicon nitride composition containing carbon, and vapor phase process. 4,036,653, Cl. 106-47.00R.

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Jacques, Michel Jean: *See—*
Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl. 423-488.000.

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Huron, Marie-Jose; Jacquin, Yves; and Renault, Philippe, 4,036,943, Cl. 423-576.000.

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James, Daniel Shaw; and Witterholt, Vincent Gerard, to Du Pont de Nemours, E. I., and Company. Bleedfast phthalocyanine dyes for paper. 4,036,585, Cl. 8-1.0XA.

Jamieson, John; Price, Henry F.; and Butts, William O., to Bell & Howell Company. Microfilm camera and photographic film handling apparatus with an actuable film clamping device. 4,037,239, Cl. 354-203.000.

Jansen, Johannes H.: *See*—
Hoffman, Neil R.; and Jansen, Johannes H., 4,036,328, Cl. 188-26.000.

Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Apparatus for reading a disc-shaped record carrier with plural scanning spots for stable radial tracking. 4,037,252, Cl. 358-128.000.

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Japan Synthetic Rubber Co., Ltd.: *See*—
Kawakami, Masato; Andoh, Naoki; Iio, Akira; and Yamanouchi, Haruo, 4,036,901, Cl. 260-669.00R.

Japan Tobacco & Salt Public Corporation, The: *See*—
Okumoto, Yutaka, 4,036,238, Cl. 131-21.00B.

Jaros, Stanley E.; and Metrailer, William J., to Exxon Research and Engineering Company. Use of activated fluid coke to remove organic contaminants from waste waters. 4,036,750, Cl. 210-27.000.

Jauch, Christian M. J., to Spartus Corporation. Clock with striking mechanism. 4,036,004, Cl. 58-9.000.

Jauch, Christian M. J., to Spartus Corporation. Clock with hour and quarter hour striking mechanism. 4,036,005, Cl. 58-9.000.

Jehle, Fritz: *See*—
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Jencks, Craig S., to United States of America, Navy. Inflatable pressure compensated helmet stabilization system. 4,035,846, Cl. 2-413.000.

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Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.

Jernow, Jane Liu: *See*—
Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,036,871, Cl. 260-468.00D.

Jespersen, Paul W.; and DeLuca, Raymond F., to Georgia-Pacific Corporation. Dispenser for liquids. 4,036,406, Cl. 222-181.000.

Jesson, Leslie William Digby, to Bentley Engineering Company, Ltd., The. Plural cam tracks for rockable jacks. 4,036,033, Cl. 66-14.000.

Jirkovsky, Ivo L.: *See*—
Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,036,842, Cl. 260-293.580.

John Zink Company: *See*—
Reed, Robert D.; Schwartz, Robert E.; and Noble, Roger K., 4,036,580, Cl. 431-202.000.

Johnson, Albert S., Jr.: *See*—
Ham, Emmett P.; and Johnson, Albert S., Jr., 4,036,045, Cl. 72-165.000.

Johnson, Dale: *See*—
Strelioff, William P.; Elliott, William S.; and Johnson, Dale, 4,036,065, Cl. 73-432.00R.

Johnson, Michael R.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832, Cl. 260-240.00R.

Johnson, Paul W., to E-Systems, Inc. Apparatus for fabricating resistors. 4,037,072, Cl. 219-56.000.

Johnson, Philip L. Truck for transport of airplane by its nose landing wheel. 4,036,384, Cl. 214-334.000.

Jones, Alan: *See*—
Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592, Cl. 23-232.00E.

Jones, Joseph K.: *See*—
Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., 4,035,869, Cl. 19-80.00R.

Jones, Keith Thomas: *See*—
Davies, Peter Gough; Jones, Keith Thomas; and Salmon, Brian, 4,036,046, Cl. 72-286.000.

Jones, Robert E. Method and apparatus for handling brick for inspection and feeding. 4,036,350, Cl. 198-420.000.

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Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592, Cl. 23-232.00E.

Jones, Vercoe C.; and Hale, Robert A., to SI Handling Systems, Inc. Vehicle and track system. 4,036,148, Cl. 104-166.000.

Jones, W. Carl: *See*—
Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., 4,036,450, Cl. 242-129.000.

Jonkuhn, Gerhard: *See*—
Sieborger, Gunter; Kilian, Ernst August; and Jonkuhn, Gerhard, 4,037,118, Cl. 307-255.000.

Jordan, Bertram L.; Mitchell, John D.; and Sessoms, J. C., Jr., to Harrington Manufacturing Company. Bulk tobacco container. 4,036,454, Cl. 294-5.500.

Jordan, Helmut; and Sivers, Curt. Ion source with capability of changing between operation modes. 4,037,108, Cl. 250-427.000.

Josef Bautz GmbH: *See*—
Moosbrucker, Karl; and Rauch, Hans, 4,035,992, Cl. 56-1.000.

Jos. Schneider & Co. Optische Werke Kreuznach: *See*—
Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, 4,036,571, Cl. 425-556.00R.

Jost, Eduard. Door brace. 4,036,518, Cl. 292-339.000.

Jouiseno-Pulp Osakeyhtio: *See*—
Makila, Eino; Virtanen, Unto; and Savinainen, Kyosti, 4,036,440, Cl. 241-20.000.

Juelke, Charles V.: *See*—
Trapasso, Louis E.; and Juelke, Charles V., 4,037,040, Cl. 526-88.000.

Junger, Hans: *See*—
Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, 4,036,798, Cl. 260-28.00P.

Jungmann, Axel: *See*—
Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, 4,036,700, Cl. 176-87.000.

Junkins, Ernest M. Automatic guiding apparatus for sewing machine. 4,036,155, Cl. 112-121.150.

Juno, Uesugi: *See*—
Chihiro, Oizumi; and Juno, Uesugi, 4,036,920, Cl. 264-.500.

JWI Ltd.: *See*—
MacBean, Donald George, 4,035,872, Cl. 24-31.00H.

K & F Manufacturing Company, Inc.: *See*—
Kocsis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David; and Pickard, John, 4,036,133, Cl. 101-415.100.

Kaasenbrood, Petrus J.C.; and Van Nassau, Petrus J.M., to Unie Van Kunstmestfabrieken, B.V. Process for preparing urea. 4,036,878, Cl. 260-555.00A.

Kabayashi, Minoru; and Miyazi, Kazumi, to Olympus Optical Co., Ltd.; and Lanier Business Products Company. Solenoid operated transcriber mechanism. 4,037,262, Cl. 360-96.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Terayama, Toshio, 4,037,179, Cl. 333-71.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904, Cl. 29-563.000.

Kabushiki Kaisha Meidensha: *See*—
Himi, Hitoshi, 4,037,187, Cl. 337-121.000.

Kabushiki Kaisha Mino Seisakusho: *See*—
Mino, Masao, 4,036,447, Cl. 242-43.200.

Kabushiki Kaisha Oshikiri Kikai Seisaku-Sho: *See*—
Oshikiri, Tatsuo, 4,036,569, Cl. 425-140.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Funaki, Takashi, 4,036,134, Cl. 101-426.000.

Kabushiki Kaisha Takechi Koumusho: *See*—
Asayama, Kingo, 4,036,026, Cl. 61-56.500.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kobayashi, Akira, 4,036,002, Cl. 57-58.890.
Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001, Cl. 57-52.000.

Kafunek, Pavel: *See*—
Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246, Cl. 357-82.000.

Kaga, Hideharu: *See*—
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,036,922, Cl. 264-35.000.

Kagan, Morton R.: *See*—
Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., 4,037,172, Cl. 331-94.50E.

Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, to Singer Company, The. Automated home knitting machine. 4,036,035, Cl. 66-75.200.

Kahn, Samuel: *See*—
Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215, Cl. 364-200.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Dixon, Cal L.; and Ross, Charles E., 4,036,366, Cl. 211-4.000.
Gane, Gordon R.; and Hoffmann, Lawrence C., Jr., 4,036,159, Cl. 113-1.00F.
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.
Taggart, Lewis W., 4,035,903, Cl. 29-458.000.

Kajiwara, Toshiyuki: *See*—
Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, 4,036,041, Cl. 72-8.000.

Kajiwara, Yuji: *See*—
Katoh, Hidehiko; Kajiwara, Yuji; and Takamizawa, Hideo, 4,037,168, Cl. 330-31.000.

Kajiyama, Shiro: *See*—
Fujiyama, Susumu; Takagawa, Minoru; and Kajiyama, Shiro, 4,036,885, Cl. 260-599.000.

Kalanit, Gideon, to Communications Patents Limited. Digital meters. 4,037,153, Cl. 324-122.000.

Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,036,841, Cl. 260-293.530.
Kaltenbach, Dieter. Table-mounted circular saw. 4,036,092, Cl. 83-471.200.
Kaltenbach & Voigt: *See*—
Saupe, Martin, 4,035,920, Cl. 32-71.000.
Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. Certain chloroamino esters of pyridine carboxylates and derivatives thereof. 4,036,843, Cl. 260-294.80R.
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. Halogenated penam derivatives and the preparation thereof. 4,036,847, Cl. 260-306.70C.
Kamon, Shunji: *See*—
Nakazato, Tetsuo; Kamon, Shunji; Tokuda, Koichi; and Honma, Keisuke, 4,035,987, Cl. 53-133.000.
Kanbe, Norio: *See*—
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.
Kansai Paint Co., Ltd.: *See*—
Takagi, Tohru, 4,036,136, Cl. 101-467.000.
Tominaga, Akira, 4,036,795, Cl. 260-18.0PN.
Kansy, Robert; and Culton, Jon, to University of Illinois Foundation. Variable delay device. 4,037,175, Cl. 333-30.00R.
Kantor, Seymour M. Locking arrangement for cabinets. 4,036,541, Cl. 312-138.00R.
Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,036,892, Cl. 260-617.00F.
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Tsuchihashi, Kiyoshi; and Takaishi, Naotake, 4,036,893, Cl. 260-617.00F.
Matsuda, Kazuo; Ohmura, Hidemasa; and Sakai, Takeyo, 4,036,801, Cl. 260-29.2TN.
Kaplan, Leon H.; Lounsbury, John Baldwin; and Zimmerman, Steven Michael, to International Business Machines Corporation. Photoresist process and photosensitive O-quinone diazide article with aliphatic carboxylic acid as adhesion promotor. 4,036,644, Cl. 96-36.000.
Karcher, Thomas D.; and Silagy, Richard J., to Hansen Manufacturing Co., The. Coupling assembly. 4,036,515, Cl. 285-315.000.
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 4,036,710, Cl. 204-52.00R.
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 4,036,711, Cl. 204-52.00R.
Karg, Gerhart; and Vaughan, Christopher D., to Avon Products, Inc. Film-forming carboxy-containing resin and a polyvalent metal salt in a hair spray and a method of using the same. 4,036,241, Cl. 132-7.000.
Karger, Eva R.; and MacGregor, Paul T., to Polaroid Corporation. Trinapthylmethane compounds. 4,036,863, Cl. 260-386.000.
Karpati, Egon: *See*—
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Karuhn, Richard F. Method of predetermining time of ovulation in women and in animals to control conception. 4,036,212, Cl. 128-2.00R.
Kasaoka, Shigeaki: *See*—
Saito, Masumi; Tani, Sumio; Matsui, Shigeaki; and Kasaoka, Shigeaki, 4,036,785, Cl. 252-472.000.
Kashimura, Toshisada: *See*—
Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl. 219-137.00R.
Kasner, Gerald: *See*—
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Kasubuchi, Takeshi: *See*—
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 4,037,230, Cl. 346-75.000.
Katakura, Eizo: *See*—
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.
Kataura, Yasuji: *See*—
Ototani, Tohei; and Kataura, Yasuji, 4,035,892, Cl. 428-576.000.
Kato, Hisao; Yagi, Hideo; and Fukuta, Shunji, to Nippon Paint Co., Ltd. Method for coating a conductive material. 4,036,721, Cl. 204-181.000.
Katoh, Hidehiko; Kajiwara, Yuji; and Takamizawa, Hideo, to Nippon Electric Company Limited. Transistorized UHF power amplifier comprising a ferroelectric sheet between a conductive base plate and a conductive pattern. 4,037,168, Cl. 330-31.000.
Katoh, Sadao, to Nissan Motor Co., Ltd. Braking fluid pressure control device. 4,036,535, Cl. 303-6.00C.
Kauchi, Yosuke: *See*—
Okumura, Kimio; Soya, Tatsunori; Kauchi, Yosuke; and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000.
Kauffman, Ivan L.; and Kellogg, Robert C., to Monsanto Company. Stretch blow molding apparatus. 4,036,573, Cl. 425-529.000.
Kauffman, Ivan L.; and Kellogg, Robert C., to Monsanto Company. Continuous stretch blow molding method. 4,036,925, Cl. 264-94.000.
Kaufman, Frank Benjamin: *See*—
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,036,648, Cl. 96-90.00R.
Kaufman, Harold B., Jr.; Moyer, John H.; and McCarthy, John P., to DCA Food Industries Inc. Method and apparatus for improved distribution of microwave power in a microwave cavity. 4,037,071, Cl. 219-10.55F.
Kaufman, Jay Stephen: *See*—
Cheng, Shih-che; and Kaufman, Jay Stephen, 4,036,289, Cl. 165-82.000.
Kaufmann, Frank H., to Steel Heddle Manufacturing Company. Heddle frame. 4,036,263, Cl. 139-91.000.
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Ray, Ranjan; and Kavesh, Sheldon, 4,036,638, Cl. 75-123.00B.
Kawabata, Mariko: *See*—
Ishimaru, Toshiyasu; and Kawabata, Mariko, 4,036,833, Cl. 260-243.00C.
Kawaguchi, Takeshi: *See*—
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Kawahara, Shigemi: *See*—
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Kawamura, Kazuo: *See*—
Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
Kawanami, Akifumi: *See*—
Orita, Nobuhiro; Yabe, Koichi; and Kawanami, Akifumi, 4,036,751, Cl. 210-35.000.
Kawasaki Steel Corporation: *See*—
Kimura, Hajime; Yoshihara, Takahisa; and Harada, Shunichi, 4,036,600, Cl. 428-555.000.
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Keblys, Kestutis A., to Ethyl Corporation. Halogen-containing diphosphonates. 4,036,809, Cl. 260-45.70P.
Keese, Larry S.: *See*—
Sietmann, Vernon H.; Smith, Raymond L.; and Keese, Larry S., 4,035,928, Cl. 34-174.000.
Keglewitsch, Josef, to Bunker Ramo Corporation. Contact for multiple conductor connector. 4,036,544, Cl. 339-91.00R.
Kelchner, Raymond E., Jr.: *See*—
Keller, Leon Brian; and Kelchner, Raymond E., Jr., 4,037,010, Cl. 428-290.000.
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Keller, Richard A., to Boschert Associates. Switching regulator power supply. 4,037,271, Cl. 363-21.000.
Kelley, John Sherburne, to USM Corporation. Method of making weakening lines in sheet metal. 4,036,160, Cl. 113-121.00C.
Kelley, Philip. Clear view coin wrap. 4,036,358, Cl. 206-.820.
Kellner, Philip R.: *See*—
Pugsley, Peter C.; and Kellner, Philip R., 4,037,075, Cl. 219-121.0LM.
Kellner, Sam J. Adjustable stand. 4,036,465, Cl. 248-463.000.
Kellogg, Robert C.: *See*—
Kauffman, Ivan L.; and Kellogg, Robert C., 4,036,573, Cl. 425-529.000.
Kauffman, Ivan L.; and Kellogg, Robert C., 4,036,925, Cl. 264-94.000.
Kelly, Allan C.: *See*—
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.
Kelly, Donald A. Helical expansion condenser. 4,036,290, Cl. 165-105.000.
Kelly, Michael Joseph: *See*—
Fugere, Albert Lee; and Kelly, Michael Joseph, 4,035,860, Cl. 12-142.00W.
Kelp, Fritz, to Kraftwerk Union Aktiengesellschaft. Power plant including a cooling tower surrounding the power plant site. 4,036,021, Cl. 60-692.000.
Kelso, Edward A.: *See*—
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Keltjens, Heinz: *See*—
Wolters, Hans Richard; and Keltjens, Heinz, 4,036,258, Cl. 137-614.040.
Kemper, Kenneth E. Traction augmenting road grips. 4,036,273, Cl. 152-225.00R.
Kempisty, Francis W., Jr.; and Lundgren, John L., to I-T-E Imperial Corporation. Lockout and cover interlock for circuit breaker. 4,037,184, Cl. 335-6.000.

Kennametal Inc.: *See*—
Huber, Joseph B.; and Brown, Thomas A., 4,036,095, Cl. 83-674.000.
McCreery, James F., 4,035,889, Cl. 29-96.000.
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Ammann, Paul R.; and Kim, Jonathan J., 4,036,636, Cl. 75-74.000.
Kennedy, Richard T.; Quitschau, Algird R.; and Kettelson, Ernest S., to Square D Company. Weatherproof junction box cover assembly. 4,036,396, Cl. 220-242.000.
Keppler, Hans Georg; Stahnecker, Erhard; and Moeller, Rolf, to BASF Aktiengesellschaft. Manufacture of expandable styrene polymers. 4,036,794, Cl. 260-2.50B.
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Filss, Peter, 4,036,597, Cl. 23-284.000.
Kettelson, Ernest S.: *See*—
Kennedy, Richard T.; Quitschau, Algird R.; and Kettelson, Ernest S., 4,036,396, Cl. 220-242.000.
Key, Edward H. Energy-efficient valve gear. 4,036,185, Cl. 123-90.250.
Keyser, David R.; and Zavod, Pierce H., to United States of America, Navy. Igniter. 4,036,581, Cl. 431-267.000.
Kibbey Machine Company, Incorporated: *See*—
Conkey, James Elliott, 4,036,123, Cl. 99-538.000.
Kieferle, Wolfgang, to Hawera probst Kommanditgesellschaft Hartmetall-Werkzeugfabric Ravensburgh. Apparatus for hardening workpieces of steel. 4,036,482, Cl. 266-252.000.
Kieley & Mueller, Inc.: *See*—
Illing, Henry, 4,036,470, Cl. 251-309.000.
Kiernan, James T. Electrical game device. 4,036,500, Cl. 273-130.0AB.
Kiko, Frederick J., to Lorain Products Corporation. Repeater for transmission lines. 4,037,066, Cl. 179-170.00G.
Kikuchi, Shintaro: *See*—
Hori, Masatake; and Kikuchi, Shintaro, 4,036,747, Cl. 210-22.00A.
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Aoyama, Kozo; Iijima, Hiroshi; and Kikuchi, Shizuo, 4,035,985, Cl. 53-30.00R.
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Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.
Kilian, Ernst August: *See*—
Sieborger, Gunter; Kilian, Ernst August; and Jonkuhn, Gerhard, 4,037,118, Cl. 307-255.000.
Kim, Jonathan J.: *See*—
Ammann, Paul R.; and Kim, Jonathan J., 4,036,636, Cl. 75-74.000.
Kim, Sung Bong. Camping pack. 4,035,855, Cl. 5-343.000.
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Kimura, Takeo: *See*—
Kobayashi, Masayoshi; and Kimura, Takeo, 4,036,193, Cl. 123-139.0AB.
Kindig, Alan L., to General Electric Company. Methods and apparatus for use in making electrical interconnections. 4,035,910, Cl. 29-628.000.
King, Francis X., Jr.: *See*—
Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., 4,035,983, Cl. 53-28.000.
King, Robert Daniel, to J. R. Schneider Co., Inc. Determining the concentration of a biocide additive in a liquid. 4,036,589, Cl. 23-230.00B.
Kinjo, legal representative; by Ayako: *See*—
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased, 4,036,650, Cl. 96-114.100.
Kinjo, Kikuo, deceased: *See*—
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased, 4,036,650, Cl. 96-114.100.
Kinoshita, Haruo: *See*—
Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, 4,036,041, Cl. 72-8.000.
Kinzebaw, Jon E., to DMI Inc. Multi-unit adjustable plow pulled by vehicle and having steering wheel turnable only on adjustment of plow. 4,036,306, Cl. 172-287.000.
Kinzenbaw, Jon E., to DMI Inc. Gang plow. 4,036,305, Cl. 172-283.000.
Kippe, Dieter: *See*—
Piekarski, Gottfried; Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund, 4,036,867, Cl. 260-448.00A.
Kirkland, Kerry G.; Masciopinto, Anthony J.; and Owens, James H., to Armco Steel Corporation. Method and apparatus for connecting flowlines to underwater installations. 4,036,295, Cl. 166-.600.
Kirpichnikov, Vladimir Pavlovich; Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich. Turntable-type microwave continuous oven. 4,037,070, Cl. 219-10.55A.
Kirschey, Gunter: *See*—
Fehler, Adolf; and Kirschey, Gunter, 4,036,582, Cl. 431-352.000.
Kisor, Thaddeus William, to RCA Corporation. Package for semiconductor components. 4,037,267, Cl. 361-220.000.
Kita, Takeshi: *See*—
Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi, 4,036,930, Cl. 264-167.000.
Kitahara, Kengo: *See*—
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.
Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, to Takeda Chemical Industries, Ltd. L-ascorbic acid tablets. 4,036,948, Cl. 424-32.000.
Kitano, Akitoshi. Elliptic gear wheel. 4,036,073, Cl. 74-393.000.
Kjell, Nordstrom: *See*—
Flinth, Rune; and Kjell, Nordstrom, 4,036,315, Cl. 177-1.000.
Klapdar, Wilhelm; Richter, Helmut; Spetzler, Edgar; and Wendorff, Jochen, to Thyssen Niederrhein AG Hutten- und Walzwerke. Process for making a steel melt for continuous casting. 4,036,635, Cl. 75-49.000.
Klauber, Gerald: *See*—
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,037,131, Cl. 313-388.000.
Klein, Keith W., to General Electric Company. Ground fault circuit breaker with trip indication. 4,037,185, Cl. 335-18.000.
Kleinerman, Marcos. Immunofluorometric method for measuring minute quantities of antigens, antibodies and other substances. 4,036,946, Cl. 424-8.000.
Kleynjan, Cornelis: *See*—
Brink, Andries; Kleynjan, Cornelis; and Beukes, Quintin John, 4,036,730, Cl. 208-8.000.
Kline, Charles R., to United States of America, Air Force. Controlled deception jamming device. 4,037,227, Cl. 343-18.00E.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Guttmann, Friedrich-Wilhelm, 4,036,612, Cl. 55-282.000.
Jakobs, Willy; and Kryczun, Alfred, 4,036,480, Cl. 266-204.000.
Jakobs, Willy; and Wilkens, Kurt, 4,036,574, Cl. 425-432.000.
Klockner-Werke AG: *See*—
Bohmer, Eberhard; and Husch, Wilhelm, 4,036,483, Cl. 266-281.000.
Klose, Robert E.: *See*—
Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 4,036,992, Cl. 426-3.000.
Kloster, Kenneth Donald. Spring compressor tool. 4,036,473, Cl. 254-10.500.
Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Asymmetric, semipermeable membranes of polybenz-1,3-oxazine diones-(2,4). 4,036,748, Cl. 210-23.00H.
Knight, Arthur Holt; and Underhill, Thomas Travis, to International Business Machines Corporation. Preconditioning image transfer areas in document reproduction machines. 4,036,556, Cl. 355-14.000.
Knight, Roy George, to Scott Bonnar Limited. Slack belt clutch. 4,036,070, Cl. 74-242.700.
Knodler, Reinhard: *See*—
Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.
Koarai, Hiroyuki: *See*—
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.
Kobashi, Toshiyuki; and Masuhara, Kenichi, to Japan Exlan Company Limited. Process for producing flame retardant acrylic synthetic fibers. 4,036,803, Cl. 260-29.6AN.
Kobayakawa, Masaki: *See*—
Matsushita, Katsuyuki; Murayama, Hideo; Yawata, Kazufumi; and Kobayakawa, Masaki, 4,035,885, Cl. 29-25.140.
Kobayakawa, Masanao: *See*—
Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001, Cl. 57-52.000.
Kobayashi, Akira, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Daiwa Boseki Kabushiki Kaisha. Dirt removal in spinning device. 4,036,002, Cl. 57-58.890.
Kobayashi, Gai; and Shikano, Yoshiro, to Mitsubishi Denki Kabushiki Kaisha. Cooling device for electric device. 4,036,291, Cl. 165-105.000.
Kobayashi, Hajime: *See*—
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased, 4,036,650, Cl. 96-114.100.
Kobayashi, Hisanori, to Nippondenso Co., Ltd. Fuel injection system. 4,036,194, Cl. 123-139.0AW.
Kobayashi, Koreyasu, to Kobayashi, Koreyasu. Zero-phase sequence protective device for faults within armature of three-phase synchronous machine. 4,037,138, Cl. 317-13.00R.
Kobayashi, Masayoshi; and Kimura, Takeo, to Diesel Kiki Kabushiki Kaisha. Electronically controlled fuel injection pump. 4,036,193, Cl. 123-139.0AB.
Kobayashi, Sadao, to Hitachi, Ltd. Method of making a junction type field effect transistor. 4,036,672, Cl. 148-175.000.
Kobayashi, Shigelu: *See*—
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.
Kobayashi, Takashi: *See*—
Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, 4,036,042, Cl. 72-9.000.
Kobayashi, Takeshi: *See*—
Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, 4,037,212, Cl. 364-200.000.
Kobe, Inc.: *See*—
Erickson, John W; Budrys, Vitolis; and Brown, Francis Barton, 4,036,427, Cl. 233-10.000.

Kobe Steel Ltd.: *See—*
Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl. 219-137.00R.
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000.

Kobelt, Volkmar. Fastener arrangements for joining or separating material edges or surfaces. 4,035,875, Cl. 24-203.00R.

Kocsis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David; and Pickard, John, to K & F Manufacturing Company, Inc. Printing plate clamping assembly. 4,036,133, Cl. 101-415.100.

Kodama, Hachio: *See—*
Ozaki, Hiromi; Yamane, Mamoru; Yoshikai, Haruo; and Kodama, Hachio, 4,036,736, Cl. 208-106.000.

Koenig, Erl A.: *See—*
D'Alessio, Frank P.; and Koenig, Erl A., 4,036,510, Cl. 280-613.000.

Koether, Bernard G.; and Witt, Allan E., to Food Automation Service Techniques, Inc. Oven cooking monitor for uniformly cooking a plurality of food items requiring different cooking times. 4,036,995, Cl. 426-233.000.

Koga, Syozi: *See—*
Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl. 219-137.00R.

Kohling, Alfons: *See—*
Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.

Koike, Keiichi; and Sasaki, Toshimi, to Hitachi, Ltd. Heat insulating coating material. 4,037,015, Cl. 428-331.000.

Koji, Itoh: *See—*
Hirai, Seizaburo; Mizoe, Yoji; and Koji, Itoh, 4,036,804, Cl. 260-29.7SQ.

Komatsu, Shigeru: *See—*
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Komendowski, Henry; and Levine, Walter, to Inhalation Therapy Equipment, Inc. Nebulizer-humidifier system. 4,036,919, Cl. 261-122.000.

Komura, Ikuo: *See—*
Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001, Cl. 57-52.000.

Kondo, Fusao: *See—*
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Kondo, Taizo: *See—*
Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904, Cl. 29-563.000.

Kondo, Toshiyuki; and Nagashima, Takashi, to Aisin Seiki Kabushiki Kaisha. Anti-skid control apparatus with booster device and pressure reducing device. 4,036,534, Cl. 303-6.00R.

Kondo, Yoshihiko, to Nippondenso Co., Ltd. Output selection control system. 4,037,146, Cl. 318-444.000.

Kononov, Nikolai Fedorovich: *See—*
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Konopeskas, Leon A. Fluid displacement apparatus. 4,036,566, Cl. 418-68.000.

Konotsune, Takuo; and Kawakubo, Katsuhiko, to Sankyo Company Limited. Pyrazolone derivatives and their use as herbicides. 4,036,631, Cl. 71-92.000.

Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, to Boehringer Ingelheim G.m.b.H. Therapeutic compositions and method. 4,036,988, Cl. 424-330.000.

Koppe, Herbert: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 4,036,972, Cl. 424-273.000.

Koreska, Rudolf Johan. Profile rail. 4,035,979, Cl. 52-737.000.

Kornfeld, Alan D., to Oxirane Corporation. Process for the manufacture of propylene oxide. 4,036,905, Cl. 260-682.000.

Korr, Abraham L.; Walker, Evan Harris; Dickey, Charles M.; and Bushey, Bransby W., to United States of America, Army. Ammunition. 4,036,140, Cl. 102-38.000.

Korr, Abraham L.; Walker, Evan Harris; and Dickey, Charles M. Ammunition. 4,036,141, Cl. 102-38.000.

Korshak, Vasily Vladimirovich; Sergeev, Vladimir Alexandrovich; and Teplyakov, Mikhail Mikhailovich. Method of preparing polymers of polyphenylene type. 4,036,818, Cl. 260-63.00K.

Kouvoussis, Anthony E.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.

Kovalchuk, Dmitry Vasilievich: *See—*
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Kowach, Ronald A.; and Rowen, William I., to General Electric Company. Twin controllable pitch propellers operated from single prime mover. 4,036,164, Cl. 115-37.000.

Kowalski, Joseph W., to B-Line Systems, Inc. Swivel connector. 4,037,098, Cl. 240-78.00R.

Kozak, Theodore Fredrick, to Union Carbide Corporation. Flexible waist diaper. 4,036,233, Cl. 128-287.000.

Kraft, Uno Ingemar, to Svenska Aktiebolaget Bromsregulator. Force limiting device for a parking brake actuator arranged in series with a service brake actuator. 4,036,533, Cl. 303-6.00A.

Kraftwerk Union Aktiengesellschaft: *See—*
Harand, Elmar; Richter, Gerd; and Tschopel, Gunter, 4,036,561, Cl. 415-18.000.
Kelp, Fritz, 4,036,021, Cl. 60-692.000.
Kumpf, Hermann, 4,035,974, Cl. 52-249.000.

Kramer, Wolfgang: *See—*
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Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,967, Cl. 424-269.000.

Kratina, Jindrich: *See—*
Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246, Cl. 357-82.000.

Kraus, Menahem A.: *See—*
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Krause, Thomas R.: *See—*
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Kreinin, Efim Vulfovich; and Zvyagintsev, Kirill Nikolaevich. Method of connection of wells by in-situ combustion. 4,036,298, Cl. 166-251.000.

Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-5-furfuryl and tetrahydrofurfuryl aminoimidazolidinones. 4,036,848, Cl. 260-306.80D.

Krimmel, Carl Peter, to G. D. Searle & Co. 3,4-Bis(4-substituted piperazinyl)-3-cyclobutene-1,2-diones and related compounds. 4,036,828, Cl. 260-239.0BC.

Krohn, David A.; and Deeg, Emil W., to American Optical Corporation. Heat treatment method for making photochromic gradient lenses. 4,036,624, Cl. 65-30.00R.

Kryczun, Alfred: *See—*
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Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, to Hitachi, Ltd. Apparatus for adjusting biasing force of leaf spring. 4,036,042, Cl. 72-9.000.

Kubota, Kenichi: *See—*
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.

Kubota Ltd.: *See—*
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Kubota, Tatsuo: *See—*
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Kuda, Vladimir: *See—*
Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, 4,036,265, Cl. 139-190.000.

Kuehn, Andrew, III, to Systematics, Inc. Capacitor discharge ignition circuit. 4,036,200, Cl. 123-148.00E.

Kugler, Robert J., to Action Packaging Corporation. Automatic filling of bags. 4,036,363, Cl. 206-526.000.

Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, to Siemens Aktiengesellschaft. Cooling arrangement for the rotor of an electric machine. 4,037,124, Cl. 310-52.000.

Kumai, Teruo: *See—*
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Kumar, Surinder: *See—*
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Kume, Hidetoshi: *See—*
Yamaguchi, Hideo; Kume, Hidetoshi; and Shibuta, Osamu, 4,036,936, Cl. 423-407.000.

Kummer, Werner: *See—*
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Kumpf, Hermann, to Kraftwerk Union Aktiengesellschaft. Pressure tank for nuclear reactors with concrete enclosure. 4,035,974, Cl. 52-249.000.

Kunegin, Vladimir Ivanovich: *See—*
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Kunesch, Rudolf: *See—*
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Kunz, Hugo. Pressure piston for a die-casting machine. 4,036,113, Cl. 92-111.000.

Kupper, Friedrich-Wilhelm; and Streck, Roland, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of 7,8-epoxy-2-methyloctadecane. 4,036,858, Cl. 260-348.50L.

Kurahashi, Yoshio: *See—*
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Kurashiki Boseki Kabushiki Kaisha: *See—*
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Kurdjukov, Alexandr Safronovich: *See—*
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mir Ivanovich; and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000.
Kurita Water Industries Ltd.: *See*—
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L. Schuler GmbH: *See*—
Braun, Hans, 4,036,087, Cl. 83-79.000.
La Soudure Electrique Autogene, Procedes Arcos, S.A.: *See*—
De Haeck, Robert Jean, 4,036,671, Cl. 148-24.000.
Labbe, Francis A. M.: *See*—
Preston, Edward G.; Rakowicz, Jan A.; and Labbe, Francis A. M., 4,036,239, Cl. 131-109.00R.
Labenz, James W. Fabric repair tool. 4,036,674, Cl. 156-98.000.
Labrunie, Guy: *See*—
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.0LC.
Lackore, James K.: *See*—
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Lair, James O.: *See*—
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Laliberte, Albert J.; and DeAngelis, Armand, to Omnitech Inc. Apparatus for coating articles. 4,036,168, Cl. 118-8.000.
Lambert, Edmund Baker, to Creative Learning, Inc. Time selective information dissemination system for use in sleep teaching. 4,035,930, Cl. 35-22.00R.
Lambert, Everette M. Lap seam folder and wide width sealer. 4,036,678, Cl. 156-461.000.
Lambert, Roy E.: *See*—
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Lambiotte, Edward J.: *See*—
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Landau, John Vernon, Jr.: *See*—
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.
Landau, Michael B., to United States of America, Navy. Fuel cell product-water management system. 4,037,024, Cl. 429-17.000.
Landers, Frank S.: *See*—
Amberg, Stephen W.; and Landers, Frank S., 4,036,675, Cl. 156-245.000.
Langen, Christianus Petrus, to H. J. Langen & Sons Ltd. Apparatus for treating meat, more particularly ham meat. 4,036,122, Cl. 99-533.000.
Langendorf, Heinrich. Truck with tiltable body. 4,036,528, Cl. 298-17.00S.
Langerbein, Bernhard: *See*—
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Langlais, Jules. Fluid metering device. 4,036,409, Cl. 222-249.000.
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Lanzilotta, Raymond P., to Syntex (U.S.A.) Inc. 18- and 19-Hydroxylated prostaglandins. 4,036,876, Cl. 260-514.00D.
Lardi, Francesco: *See*—
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Larkin, William A.; and Stoloff, Alfred, to M & T Chemicals Inc. Process for recovering organotin halides. 4,036,866, Cl. 260-429.700.
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Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,036,478, Cl. 266-133.000.
Larsen, Ole Jeppe Fjord. Method of producing and protecting deposits of sedimentary material on floors of bodies of water. 4,036,022, Cl. 61-3.000.
Laschuk, Eugeny Eustafievich: *See*—
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.
Lassanske, George G., to Outboard Marine Corporation. Variable speed power transmission including means for minimizing backlash. 4,036,075, Cl. 74-409.000.
Lassiter, Marvin Stevens, Sr., to American Cyanamid Company. Dewatering clay slurries. 4,036,752, Cl. 210-46.000.
Laub, Hans: *See*—
Januschkowetz, Herbert; and Laub, Hans, 4,036,707, Cl. 204-20.000.
Laufer, Siegmar; and Roy, Waldemar, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Highly-active, finely divided superdry silicon dioxide. 4,036,933, Cl. 423-338.000.
Laugier, Robert: *See*—
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Laurer, Gerard R. Radiation detector with array of different scintillators. 4,037,105, Cl. 250-367.000.
Lavallee, Donald C.: *See*—
Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,037,186, Cl. 335-206.000.
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Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,037,027, Cl. 429-104.000.
Leavines, Joseph E. High temperature parallel resistance pipe heater. 4,037,083, Cl. 219-552.000.
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Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.
Lederer, Edgar: *See*—
Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000.
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Lednicer, Daniel, to Upjohn Company, The. Polycyclophenylpyrrolidines, their compositions and use. 4,036,977, Cl. 424-274.000.
Lee, Barry Thomas; and Hyatt, Gilbert Peter. Electronic lock and key system. 4,036,178, Cl. 119-51.00R.
Lee, Charles Meng-Yuan, to Bell Telephone Laboratories, Incorporated. Bipolar switching transistor using a Schottky diode clamp. 4,037,115, Cl. 307-214.000.
Lee, Kyu Tai, to Du Pont de Nemours, E. I., and Company. 6,7-Methylenedioxy-1-(2,2,2-trifluoroethyl)-4(1H)-quinolone-3-carboxylic acid and its salts and esters. 4,036,962, Cl. 424-258.000.
Lee, Poy. Sure grip winter tire traction device. 4,036,272, Cl. 152-210.000.
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Lefkowitz, Michael; and Taylor, Michael Gordon, to Bell Telephone Laboratories, Incorporated. Fault isolation in communications circuits. 4,037,050, Cl. 178-69.00G.
Le Goux, Jean Jacques: *See*—
Dubois, Jean Claude; and Le Goux, Jean Jacques, 4,036,777, Cl. 250-299.000.
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Kirpichnikov, Vladimir Pavlovich; Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich, 4,037,070, Cl. 219-10.55A.
Leitz, Ludwig; and Mandler, Walter, to Ernst Leitz G.m.b.H. Still pocket camera. 4,037,238, Cl. 354-152.000.
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Lemonnier, Jean: *See*—
Bush, John H.; and Lemonnier, Jean, 4,036,698, Cl. 195-103.50M.
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Zimmermann, Fritz; and Lenk, Arthur, 4,036,606, Cl. 48-77.000.
Leonard, Kenneth R.; and DeHaan, James R., to Cryogenic Technology, Inc. Support system for an elongated cryogenic envelope. 4,036,617, Cl. 62-55.000.
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Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.
Leroi, Jean-Claude; and Vachet, Francois, to Rhone-Poulenc Industries. Method of separating chlorinated aliphatic hydrocarbons with 1 to 3 carbon atoms from mixtures thereof by extractive distillation. 4,036,703, Cl. 203-57.000.
Lerouge, Claude Paul Henri: *See*—
Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, 4,037,120, Cl. 307-311.000.
Les Traitements de Surface Nobel-Bozel: *See*—
Arjalies, Georges; and Guillais, Jean-Claude, 4,036,337, Cl. 191-1.00A.
Lester, Thomas J., to Lester Tire Company, The. Method of making composite motorcycle wheel. 4,035,895, Cl. 29-159.030.
Lester Tire Company, The: *See*—
Lester, Thomas J., 4,035,895, Cl. 29-159.030.
Lettau, Hans: *See*—
Betzmeir, Helmut; and Lettau, Hans, 4,036,685, Cl. 176-19.0LD.
Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich. Three-phase discharge lamp. 4,037,128, Cl. 313-188.000.
Levine, David W.; Thilly, William G.; and Wang, Daniel I. C., to Massachusetts Institute of Technology. Treatment of cell culture microcarries. 4,036,693, Cl. 195-1.800.
Levine, Walter: *See*—
Komendowski, Henry; and Levine, Walter, 4,036,919, Cl. 261-122.000.
Levischev, Arkady Nikolaevich: *See*—
Ivin, Jury Filoretovich; Levischev, Arkady Nikolaevich; and Sokolov, Vasily Ivanovich, 4,036,429, Cl. 233-27.000.
Levy, Barnett. Indicator device. 4,036,502, Cl. 273-142.00J.
Levy, Joseph; and Christensen, Nils J., to UOP Inc. Synthesis of prenyl chloride. 4,036,899, Cl. 260-654.00R.
Lewis, Arthur M., to Westinghouse Electric Corporation. Meter dial encoder for remote meter reading. 4,037,219, Cl. 340-204.000.
Lexsuco, Inc.: *See*—
Harvey, William R., 4,036,422, Cl. 227-110.000.

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van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., 4,036,774, Cl. 252-132.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang; and Messerschmidt, Jurgen, 4,036,485, Cl. 269-285.000.
Volkner, Wolfgang; and Schmedemann, Helmuth, 4,036,457, Cl. 244-134.00D.

Liesenborghs, Roland: *See—*
Montbrun, Felix; and Liesenborghs, Roland, 4,037,074, Cl. 219-121.00P.

Liljendahl, Sven Algot Joel. Quickly attachable button. 4,035,874, Cl. 24-90.00E.

Linca, Ion: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.

Lindauer Dornier Gesellschaft mbH.: *See—*
Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, 4,036,266, Cl. 139-304.000.

Linkletter, Merle G.: *See—*
Schmitt, Arnold J.; and Linkletter, Merle G., 4,036,684, Cl. 162-290.000.

Linn, Donald F.; Schmidt, Frederick C.; and Yanko, John P., to Lipe-Rollway Corporation. Sealed oil-filled clutch. 4,036,338, Cl. 192-13.00R.

Lion Fat & Oil Co., Ltd.: *See—*
Ogoshi, Toshiaki; Miyawaki, Yozo; Kondo, Fusao; and Sakurai, Susumu, 4,036,596, Cl. 23-283.000.

Lipe-Rollway Corporation: *See—*
Linn, Donald F.; Schmidt, Frederick C.; and Yanko, John P., 4,036,338, Cl. 192-13.00R.

Lipilov, Alexandr Sergeevich: *See—*
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F.

Lipin, Anatoly Alexeevich: *See—*
Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davydovich; Suxov, Gennady Ilich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000.

Little, Thomas Hamilton, to Pennwalt Corporation. Method of cleaning a centrifuge. 4,036,426, Cl. 233-7.000.

Livingston, Richard W. Coin operated vacuum apparatus. 4,036,346, Cl. 194-9.00T.

Lockwood, Frank J. Pinwheel for paper feeding. 4,036,420, Cl. 226-87.000.

Loews Theatres, Inc.: *See—*
Berry, R. Arlen; and Thompson, Albert W., 4,036,380, Cl. 214-305.000.

Loftus, Edward J.; and Hofberger, Gerald F., to Hofberger, Gerald F. Pipe fitting. 4,036,513, Cl. 285-179.000.

Logan, Forrest E.: *See—*
Gundzik, Richard M.; and Logan, Forrest E., 4,036,608, Cl. 55-89.000.

Lohmann, Frank, to Ciba-Geigy Corporation. Aqueous, storage-stable dispersions of water-soluble compounds. 4,036,778, Cl. 252-301.210.

Lohwasser, Hermann; Nogaj, Alfred; and Reinehr, Ulrich, to Bayer Aktiengesellschaft. Process for the production of bulk yarns. 4,035,884, Cl. 28-281.000.

Loken, Bjarte; MacDonald, Peter Lindsay; and Bigatti, Ettore, to Steroid Development Company Establishment. Trimethyl siloxane steroid intermediates. 4,036,831, Cl. 260-239.55D.

Longoni, Angelo: *See—*
Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, 4,036,963, Cl. 424-258.000.

Loper, Bernd, to Daimler-Benz Aktiengesellschaft. Installation for automatic control of the light distance with motor vehicle headlights. 4,037,134, Cl. 315-78.000.

Lorain Products Corporation: *See—*
Kiko, Frederick J., 4,037,066, Cl. 179-170.00G.

Lorenz, Karl: *See—*
Lorenzini, Robert E.; Iwata, Akiyoshi; and Lorenz, Karl, 4,036,595, Cl. 23-273.0SP.

Lorenzini, Robert E.; Iwata, Akiyoshi; and Lorenz, Karl, to Siltec Corporation. Continuous crystal growing furnace. 4,036,595, Cl. 23-273.0SP.

Losinger AG of Bern: *See—*
Dietrich, Hans, 4,036,137, Cl. 102-23.000.

Loudon, John D.: *See—*
Leonard, Kenneth R.; and Loudon, John D., 4,036,618, Cl. 62-55.000.

Louis nee Ester, Brigitte, heir: *See—*
Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.

Lounsbury, John Baldwin: *See—*
Kaplan, Leon H.; Lounsbury, John Baldwin; and Zimmerman, Steven Michael, 4,036,644, Cl. 96-36.000.

Loveland, Steven: *See—*
Campbell, Roy L.; and Loveland, Steven, 4,036,210, Cl. 128-2.00F.

Lowder, F. Ray; and Gibbon, John D., to Celanese Corporation; and Fiber Industries, Inc. Poly(ethylene terephthalate) fibrillated tape sewing thread. 4,036,003, Cl. 57-140.00R.

Lowe, Gerald W. Combination foldable golf club carrier and score keeping device. 4,036,416, Cl. 224-45.00R.

Lowe, William L.: *See—*
Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, 4,036,372, Cl. 212-144.000.

Lowery, Edward L.: *See—*
Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., 4,037,011, Cl. 428-294.000.

Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., to Southwire Company. Method and apparatus for paying out wire. 4,036,450, Cl. 242-129.000.

Lu, Chih-shun, to Inficon Leybold-Heraeus Inc. Apparatus for monitoring vacuum deposition processes. 4,036,167, Cl. 118-7.000.

Lubrizol Corporation, The: *See—*
Dorer, Casper John, Jr., 4,036,772, Cl. 252-56.00R.

Lucas Electrical Company Limited: *See—*
Wilkinson, Norman, 4,036,817, Cl. 200-61.270.

Lucas, Harold P., to Lucas, Harold P. Method of panel re-facing building walls. 4,035,980, Cl. 52-745.000.

Lucas, Roger; and Auberger, Jacques, to FORGEAL, societe pour le Forgeage et l'Estampage des Alliages Legers. Method of forging and press-forming aluminum wheel. 4,035,891, Cl. 29-159.010.

Lucero, Daniel P.; and Teets, Alan R., to Meloy Laboratories, Inc. Temperature-controlled apparatus for fluid permeation or the like. 4,036,915, Cl. 261-104.000.

Luebbers, Willi, to Nico-Pyrotechnik Hanns-Juergen Diederichs KG. Percussion fuse assembly. 4,036,145, Cl. 102-73.00R.

Luke, John Anthony, to Brown & Williamson Tobacco Corporation. Apparatus for cigarette filter manufacture. 4,036,114, Cl. 93-1.00C.

Lummus Company, The: *See—*
Riegel, Herbert D.; Schindler, Harvey D.; and Strangio, Vincent A., 4,036,776, Cl. 252-187.00R.
Strangio, Vincent A.; Riegel, Herbert; and Sze, Morgan C., 4,036,897, Cl. 260-648.00C.
Strangio, Vincent A., 4,036,900, Cl. 260-659.00R.

Lund, David Yngve Mikael: *See—*
Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.

Lund, Glenn A. L.: *See—*
Soderlind, Richard Leroy; and Lund, Glenn A. L., 4,036,438, Cl. 239-288.500.

Lundgren, John L.: *See—*
Kempisty, Francis W., Jr.; and Lundgren, John L., 4,037,184, Cl. 335-6.000.

Lundmark, Anders Gunnar Rudolf: *See—*
Sjostrand, Fritiof Stig; Lundmark, Anders Gunnar Rudolf; and Ekstrom, Gosta Ivar, 4,036,085, Cl. 81-52.300.

Lupinacci, George: *See—*
Feldman, Edward; and Lupinacci, George, 4,036,349, Cl. 197-151.000.

Lutz, Herbert; and Pfeiler, Manfred, to Siemens Aktiengesellschaft. X-ray diagnosing apparatus with several photographing systems selectively connectable to a common generator. 4,037,107, Cl. 250-402.000.

Lutz, Horst: *See—*
Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl. 210-168.000.

Luukonen, Leroy D.; and Tieden, Arthur E. Attachment to pole skidder vehicle for loading, hauling, and stacking cut logs. 4,036,378, Cl. 214-92.000.

Lux, Joseph W.; and Varanelli, John M., to Robertshaw Controls Company. Apparatus for joining two abutting metal members together and method of making such apparatus. 4,035,901, Cl. 29-243.500.

Lyon, David L., to Intertel, Inc. Modulator and demodulator for data communications network. 4,037,049, Cl. 178-67.000.

Lyon, Warren Charles: *See—*
Barr, Harold N.; Lyon, Warren Charles; and Bustard, Thomas S., 4,036,665, Cl. 136-202.000.

Lyons, Bernard J., to Raychem Corporation. Irradiatable polymer composition with improved oxidation resistance. 4,036,719, Cl. 204-159.140.

M. E. Cunningham Company: *See—*
Speicher, Edwin W., 4,036,127, Cl. 101-5.000.

M & T Chemicals Inc.: *See—*
Chopdekar, Vilas M., 4,036,889, Cl. 260-606.50P.
Harbulak, Edward P., 4,036,709, Cl. 204-43.00T.
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,710, Cl. 204-52.00R.
Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,711, Cl. 204-52.00R.
Larkin, William A.; and Stoloff, Alfred, 4,036,866, Cl. 260-429.700.

Maalouf, George E., to Moore Business Forms, Inc. Carbonless manifold business forms. 4,036,511, Cl. 282-27.500.

Mabuchi, Kenichi, to Mabuchi Motor Co. Ltd. Adapter for non-standard sized battery. 4,037,026, Cl. 429-100.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi, 4,037,026, Cl. 429-100.000.

MacBean, Donald George, to JWI Ltd. Method of closing fabric seams. 4,035,872, Cl. 24-31.00H.

MacDonald, Peter Lindsay: *See—*
Loken, Bjarte; MacDonald, Peter Lindsay; and Bigatti, Ettore, 4,036,831, Cl. 260-239.55D.

MacGregor, Paul T.: *See—*
Karger, Eva R.; and MacGregor, Paul T., 4,036,863, Cl. 260-386.000.

Mack, Karl: *See*—
Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R.

MacPherson Powders Limited: *See*—
Harvey, Peter, 4,036,169, Cl. 118-66.000.

Madigan, William Thomas: *See*—
Hardman, Bruce Bertolette; and Madigan, William Thomas, 4,036,813, Cl. 260-46.50G.

Madl, Josef; and Schober, Hans. Device for forming trim patterns in fur. 4,035,913, Cl. 30-287.000.

Maeda, Noriyuki: *See*—
Hayashi, Tsutomu; Kawaguchi, Takeshi; and Maeda, Noriyuki, 4,036,331, Cl. 188-187.000.

Maeda, Tetsuya: *See*—
Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.

Maeyama, Shigeo: *See*—
Kawai, Shinichi; Maeyama, Shigeo; and Shidara, Tokihiko, 4,037,127, Cl. 313-60.000.

Magnin, Pierre: *See*—
Dulou, Raymond; Magnin, Pierre; and Bechtel, Pierre, 4,036,884, Cl. 260-586.00G.

Magre, Eduard P.: *See*—
Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., 4,036,898, Cl. 260-649.00R.

Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, to Perkin-Elmer Corporation, The. Method for blood film preparation. 4,037,003, Cl. 427-2.000.

Maida, Osamu, to Nippon Kogaku K.K. Electromagnetic trigger device in motor-driven camera capable of time exposure. 4,036,555, Cl. 352-169.000.

Maier, Daniel F.; and Sheldon, John D., to Outboard Marine Corporation. Marine propulsion device having increased reverse thrust. 4,036,162, Cl. 115-17.000.

Maier, Siegmund: *See*—
Piekarski, Gottfried; Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund, 4,036,867, Cl. 260-448.00A.

Maierhofer, Hans-Jurgen: *See*—
Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, 4,036,266, Cl. 139-304.000.

Maigret, Robert J., to Eastman Kodak Company. Exposure control apparatus. 4,037,237, Cl. 354-51.000.

Majima, Tsuyoshi; and Hara, Katsunosuke, to NGK Insulators, Ltd. Pyrolysis process for treating sewage sludge containing chromium. 4,036,753, Cl. 210-63.00R.

Makila, Eino; Virtanen, Unto; and Savinainen, Kyosti, to Joutseno-Pulp Osakeyhtio. Method and apparatus for the treatment of waste wood, such as stumps and snag, to make it suitable for the production of paper pulp. 4,036,440, Cl. 241-20.000.

Makino, Tadashi: *See*—
Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, 4,036,948, Cl. 424-32.000.

Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Device for supporting the slay drive of a loom. 4,036,265, Cl. 139-190.000.

Maldonado, Juan Ramon: *See*—
Coquin, Gerald Allan; Maldonado, Juan Ramon; Maydan, Dan; and Somekh, Sasson Roger, 4,037,111, Cl. 250-505.000.

Malmin, Oscar. Cartridge and sealing means therefor. 4,036,226, Cl. 128-218.00D.

Mandler, Walter: *See*—
Leitz, Ludwig; and Mandler, Walter, 4,037,238, Cl. 354-152.000.

Mandrin, Charles, to Sulzer Brothers Limited. Process and apparatus for evaporating and heating liquified natural gas. 4,036,028, Cl. 62-52.000.

Maniar, Gunvant N.: *See*—
Philip, Thoni V.; and Maniar, Gunvant N., 4,036,640, Cl. 75-126.00C.

Manne, Richard S.; Bethea, Sam R.; and Kelso, Edward A., to Exxon Research and Engineering Company. Process for manufacturing naphthenic solvents and low aromatics mineral spirits. 4,036,734, Cl. 208-57.000.

Mannesmann Aktiengesellschaft: *See*—
Wolters, Hans Richard; and Keltjens, Heinz, 4,036,258, Cl. 137-614.040.

Manning, Harold E., to Petro-Tex Chemical Corporation. Dehydrogenation catalyst. 4,036,781, Cl. 252-439.000.

Manthey, Willi; and Deiwick, Horst, to BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H. Apparatus for cooling hot slabs. 4,036,243, Cl. 134-76.000.

Manuccia, Thomas J.: *See*—
Clark, Marion D.; and Manuccia, Thomas J., 4,036,720, Cl. 204-177.000.

Maples, Jack S.: *See*—
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.

Marais, Sarel Johannes. Plough share with reinforcement plate covering tongue holes therein. 4,036,307, Cl. 172-749.000.

Marangoni, Carlo. Machine for treating worn out pneumatic tires and for applying a pre-molded tread ring. 4,036,677, Cl. 156-394.000.

Margerum, John D.: *See*—
Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.

Marinello, Rosolino. Apparatus for assisting the treatment of wounds or inflammations internal to the human body. 4,036,229, Cl. 128-268.000.

Marquardt, Warren B.: *See*—
Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.

Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., to Texaco Development Corporation. Method of preparing polyaminopolyphenylmethanes. 4,036,880, Cl. 260-570.00D.

Marrotte, Gary J.; and Mulder, H. Christopher. Cartridge belt guide for ammunition box. 4,036,102, Cl. 89-33.0BB.

Martens, Theophile: *See*—
Bernet, Henri Georges; and Martens, Theophile, 4,036,603, Cl. 44-13.000.

Martin, Albert R., to Harris Corporation. Chirp communication system. 4,037,159, Cl. 325-30.000.

Martin, Fred David: *See*—
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,036,660, Cl. 106-90.000.

Martin, Lincoln A., to Geophysical Systems Corporation. Method of vibratory seismic prospecting for minimum correlation noise. 4,037,190, Cl. 340-15.5TA.

Martin Marietta Corporation: *See*—
Taylor, Glen J., 4,037,047, Cl. 174-68.500.

Martin, Marvin C. Disposable beverage container cover element carrying folded drinking straw. 4,036,392, Cl. 220-23.000.

Martin, Terence Geoffrey, to Coal Industry (Patents) Limited. Hydrogenation of coal. 4,036,731, Cl. 208-8.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D., 4,036,492, Cl. 273-1.00R.
Breslow, Jeffrey D., 4,036,493, Cl. 273-1.00M.

Marx, Michael: *See*—
Walker, Keith A. M.; and Marx, Michael, 4,036,970, Cl. 424-273.000.
Walker, Keith A. M.; and Marx, Michael, 4,036,973, Cl. 424-273.000.
Walker, Keith A. M.; and Marx, Michael, 4,036,974, Cl. 424-273.000.

Marynissen, William E., to Bic Pen Corporation. Lighter. 4,036,579, Cl. 431-131.000.

Marzluff, William Frank: *See*—
Castellion, George Augustus; and Marzluff, William Frank, 4,036,870, Cl. 260-465.300.

Maschinenfabrik Schweiter AG: *See*—
Suter, Xaver, 4,036,353, Cl. 198-486.000.
Suter, Xaver, 4,036,444, Cl. 242-35.60E.

Maschinenfabrik Wifag: *See*—
Heimlicher, Paul; and Von Hein, Eduard, 4,036,487, Cl. 270-71.000.

Masciopinto, Anthony J.: *See*—
Kirkland, Kerry G.; Masciopinto, Anthony J.; and Owens, James H., 4,036,295, Cl. 166-.600.

Mashimo, Yukio: *See*—
Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233, Cl. 354-23.00D.

Maslanka, William Walter, to Hercules Incorporated. Electroconductive paper. 4,037,017, Cl. 428-413.000.

Masloboev-Shvedov, Alexei Alexeevich: *See*—
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Massachusetts General Hospital, The: *See*—
Haber, Edgar, 4,036,945, Cl. 424-1.000.

Massachusetts Institute of Technology: *See*—
Levine, David W.; Thilly, William G.; and Wang, Daniel I. C., 4,036,693, Cl. 195-1.800.

Massey, Janet E. Educational game. 4,035,932, Cl. 35-35.00D.

Mast, Aquila D.: *See*—
Crane, Jack W.; and Mast, Aquila D., 4,035,999, Cl. 56-341.000.

Masuda, Toyotsugu: *See*—
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Masuhara, Kenichi: *See*—
Kobashi, Toshiyuki; and Masuhara, Kenichi, 4,036,803, Cl. 260-29.6AN.

Mata, Justo M.: *See*—
Stapley, Edward O.; and Mata, Justo M., 4,036,696, Cl. 195-80.00R.

Material Control, Inc.: *See*—
Reiter, Robert C., 4,036,351, Cl. 198-499.000.
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Mathauser, William R. Bicycle brake shoe with heat dissipating means. 4,036,333, Cl. 188-264.00A.

Mathe, Tibor: *See*—
Petro, Jozsef; Mathe, Tibor; and Tungler, Antal, 4,036,877, Cl. 260-515.00R.

Mathers, James E.: *See*—
Shaffer, Francis N.; and Mathers, James E., 4,037,110, Cl. 250-483.000.

Mathias Bauerle GmbH: *See*—
Raible, Hermann; and Muller, Rolf, 4,036,135, Cl. 101-463.000.

Mathis, Paul-Henri: *See*—
Caspar, Raymond; and Mathis, Paul-Henri, 4,035,968, Cl. 52-63.000.

Matovich, Edwin, to Thagard Technology Company. High temperature fluid-wall reactors for transportation equipment. 4,036,181, Cl. 123-3.000.

Matsuda, Hironobu, to Olympus Optical Co., Ltd. Automatic tape cassette-assembling system. 4,035,899, Cl. 29-773.000.

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Saito, Masumi; Tani, Sumio; Matsui, Shigeaki; and Kasaoka, Shigeaki, 4,036,785, Cl. 252-472.000.

Matsuka, Shigemichi: *See*—
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Matsumoto, Kuniaki; Hatakeyama, Junichi; and Okamoto, Masaharu, to Hitachi, Ltd. Flood control system for a dam. 4,036,023, Cl. 61-25.000.

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Sugiyama, Iwakichi; Takaoka, Yukihisa; and Endo, Kiyoshi, 4,036,796, Cl. 260-22.0CA.

Matsuo, Kazumasa: *See*—
Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl. 128-4.000.

Matsushima, Hisatomo: *See*—
Honda, Takeo; and Matsushima, Hisatomo, 4,036,549, Cl. 339-275.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Nagaoka, Tadashi, 4,037,253, Cl. 358-128.000.
Ono, Shusuke; Wasa, Kiyotaka; and Hayakawa, Shigeru, 4,037,176, Cl. 333-30.00R.

Matsushita, Katsuyuki; Murayama, Hideo; Yawata, Kazufumi; and Kobayakawa, Masaki, to Nippon Electric Kagoshima, Ltd. Method for producing multi-figure luminescent display tubes. 4,035,885, Cl. 29-25.140.

Matsushita, Tomiharu: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000.

Matthey, Henri; and Delessert, Georges, to Telectronics SA. Device for the bidirectional movement of an information support. 4,036,458, Cl. 242-201.000.

Mattocks, George Roland: *See*—
Holmes, Charles Chamberlain; Skinner, Wallace; and Mattocks, George Roland, 4,036,625, Cl. 65-134.000.

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Gillard, Claude; and Mauroy, Marcel, 4,036,222, Cl. 128-2.080.

Maury, Jean-Robert. Bicompartmental syringe. 4,036,225, Cl. 128-218.00M.

Maxsted, Malcolm D.: *See*—
Dixon, Robert L.; and Maxsted, Malcolm D., 4,036,313, Cl. 175-344.000.

May & Baker Limited: *See*—
Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, 4,036,872, Cl. 260-468.00D.

Maydan, Dan: *See*—
Coquin, Gerald Allan; Maldonado, Juan Ramon; Maydan, Dan; and Somekh, Sasson Roger, 4,037,111, Cl. 250-505.000.

Mayhew, Raymond Leonard: *See*—
Tilson, Edward Arthur; and Mayhew, Raymond Leonard, 4,037,012, Cl. 428-304.000.

Maykut, Albert R.: *See*—
Betts, Robert E.; Thorn, Lawrence B.; and Maykut, Albert R., 4,036,013, Cl. 60-271.000.

McAvoy, Nelson: *See*—
Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., 4,037,172, Cl. 331-94.50E.

McCarthy, James B.: *See*—
Galonska, David A.; McCarthy, James B.; and Rutkiewicz, Joseph A., 4,036,110, Cl. 91-375.00A.

McCarthy, John P.: *See*—
Kaufman, Harold B., Jr.; Moyer, John H.; and McCarthy, John P., 4,037,071, Cl. 219-10.55F.

McCarty, James C.; and Mendola, Dominick, to Syntex (U.S.A.) Inc. System for culturing aquatic animals. 4,036,176, Cl. 119-3.000.

McClain, A. Ervin: *See*—
Bennett, Robert L.; Parrott, Orville C.; Getzin, Allan R.; and McClain, A. Ervin, 4,036,611, Cl. 55-149.000.

McClintic, Wayne L.; and Sheetz, Charles E., to FMC Corporation. Bin destacker and restacker. 4,036,375, Cl. 214-6.00F.

McCombs, Frank P.: *See*—
Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., 4,036,806, Cl. 260-37.00N.

McCoy, Robert M.: *See*—
Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,037,126, Cl. 310-260.000.

McCracken, Charles Kennedy, to Trane Company, The. Incineration system for the disposal of a waste gas and method of operation. 4,036,576, Cl. 431-5.000.

McCreery, James F., to Kennametal Inc. Cut off tool. 4,035,889, Cl. 29-96.000.

McDonald, Gregory. Microphone holder assembly. 4,037,063, Cl. 179-147.000.

McDonnell Douglas Corporation. *See*—
Anderson, John H.; and Waters, Elmer D., 4,036,286, Cl. 165-45.000.

McGahan, Everett G.; and Melanko, Charles L. Video switcher. 4,037,250, Cl. 358-108.000.

McGill, Kenneth Harmon: *See*—
Eddy, Kenneth Harmon; and McGill, Kenneth Harmon, 4,036,508, Cl. 280-492.000.

McGilvray, Malcolm Canmore, Jr.: *See*—
Durland, Douglas Howard; and McGilvray, Malcolm Canmore, Jr., 4,036,428, Cl. 233-23.00R.

McGinniss, Vincent Daniel, to SCM Corporation. Cationic aqueous compositions of polymer having amine groups, acid neutralized, and abis-maleimide cross-linker, coatings and process. 4,037,018, Cl. 428-418.000.

McIntosh, Lawrie Gandier: *See*—
Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, 4,036,415, Cl. 223-40.000.

McKeon, John F.; and Lambert, Roy E., to FMC Corporation. Welded steel roller chain. 4,036,072, Cl. 74-245.00R.

McKinney, Joel D.: *See*—
Readal, Thomas C.; McKinney, Joel D.; and Titmus, Robert A., 4,036,740, Cl. 208-120.000.

McKnight, Oliver R.; and Seaman, William M., Jr., to Hollis and Company. Sprocket and method for producing same. 4,036,071, Cl. 74-243.00R.

McLane, Martin M.; and Newsom, Raymond A., to Monsanto Company. Recovery of iodine. 4,036,940, Cl. 423-503.000.

McPhee, John, to Rusco Industries, Inc. Fail safe press brake guard. 4,036,343, Cl. 192-134.000.

McQuinn, Ted M., to General Motors Corporation. Feed and accumulator control of trimmer valve boost pressure. 4,036,083, Cl. 74-867.000.

McRae, Brian Joseph: *See*—
McRae, Lucy Theresa; and McRae, Brian Joseph, 4,035,865, Cl. 16-114.00R.

McRae, Lucy Theresa; and McRae, Brian Joseph. Implements usable by persons afflicted with arthritis. 4,035,865, Cl. 16-114.00R.

Meader, Arthur L., Jr., to Chevron Research Company. Polyurethane precursors containing thixotropic agents. 4,036,797, Cl. 260-28.00R.

Meadowcraft, Ronald Ross; and Bain, Alastair Stewart, to Atomic Energy of Canada Limited. Nuclear fuel element. 4,036,691, Cl. 176-68.000.

Mearl Corporation, The: *See*—
Bucco, Mario P.; and Van Valkenburg, Alvin, 4,036,656, Cl. 106-88.000.

Meckstroth, Alan F.: *See*—
Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 4,036,519, Cl. 296-1.00S.

Meek, James M., to United States of America, Army. Arming system. 4,036,144, Cl. 102-70.20R.

Mefina S.A.: *See*—
Fresard, Marcel; Baruffa, Olindo; and Gabriel, Jean-Pierre, 4,036,158, Cl. 112-258.000.

Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, to Hokkaido Sugar Co., Ltd. Process for beet sugar production. 4,036,694, Cl. 195-11.000.

Mehta, Povindar K., to Reagents of the University of California. High iron oxide hydraulic cement. 4,036,657, Cl. 106-89.000.

Meier, Otto: *See*—
Scheidweiler, Andreas; and Meier, Otto, 4,037,106, Cl. 250-381.000.

Meininger, Fritz: *See*—
Fuchs, Hermann; and Meininger, Fritz, 4,036,825, Cl. 260-196.000.

Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 4,036,966, Cl. 424-269.000.

Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 4,036,967, Cl. 424-269.000.

Meiser, Werner: *See*—
Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 4,036,632, Cl. 71-93.000.

Melanko, Charles L.: *See*—
McGahan, Everett G.; and Melanko, Charles L., 4,037,250, Cl. 358-108.000.

Melcher, Charles H.: *See*—
Hartwick, William F.; and Melcher, Charles H., 4,036,251, Cl. 137-512.100.

Meloy Laboratories, Inc.: *See*—
Lucero, Daniel P.; and Teets, Alan R., 4,036,915, Cl. 261-104.000.

Menard, Jacques Pierre Raymond Raphael: *See*—
Goujon, Roger Hubert; Menard, Jacques Pierre Raymond Raphael; and Pagny, Georges Claude Andre, 4,037,156, Cl. 324-158.00R.

Mendola, Dominick: *See*—
McCarty, James C.; and Mendola, Dominick, 4,036,176, Cl. 119-3.000.

Mercer, Alec Victor; and Oakland, John Stephen, to Sandoz Ltd. 1,3-Diphenyl substituted pyrazolines. 4,036,851, Cl. 260-310.00D.

Merck & Co., Inc.: *See*—
Stapley, Edward O.; and Mata, Justo M., 4,036,696, Cl. 195-80.00R.

Merianos, John J.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,036,959, Cl. 424-248.560.

Merkle, Roland: *See*—
Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl. 210-168.000.

Merrifield, D. Bruce: *See*—
Hopkins, George C.; and Merrifield, D. Bruce, 4,036,810, Cl. 260-45.75W.

Messerschmidt, Jurgen: *See*—
Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang; and Messerschmidt, Jurgen, 4,036,485, Cl. 269-285.000.

Messinger, Werner: *See—*
Blume, Friedrich, deceased; Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.
Metallgesellschaft Aktiengesellschaft: *See—*
Gluck, Walter, 4,035,886, Cl. 29-25.190.
Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, 4,036,865, Cl. 260-428.000.
Metex Corporation: *See—*
Severinsen, John, 4,037,009, Cl. 428-241.000.
Metrailer, William J.: *See—*
Jaros, Stanley E.; and Metrailer, William J., 4,036,750, Cl. 210-27.000.
Meyer, Daniel J.: *See—*
Alexander, Merwin K.; Meyer, Daniel J.; and Cohen, Philip, 4,036,459, Cl. 248-11.000.
Meyer, Jacques: *See—*
Chretien, Gilbert; Ditacroute, Gerard; and Meyer, Jacques, 4,036,908, Cl. 260-863.000.
Meyn, Pieter. Apparatus for removing the neck from a fowl. 4,035,867, Cl. 17-11.000.
Mezei, John R. Trailer mounted automobile crusher. 4,036,125, Cl. 100-100.000.
Michaels, Alan S.: *See—*
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,036,227, Cl. 128-260.000.
Michel, Karl, to Gebruder Vieler GmbH. Support structure for furniture, shelves or the like. 4,036,371, Cl. 211-182.000.
Michel, Pierre: *See—*
Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl. 423-488.000.
Michieli, Giannantonio: *See—*
Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, 4,036,963, Cl. 424-258.000.
Mickey, Edgar G.; and Nelson, Gerald H., to Micknel Manufacturing Inc. Sign construction. 4,035,940, Cl. 40-140.000.
Micknel Manufacturing Inc.: *See—*
Mickey, Edgar G.; and Nelson, Gerald H., 4,035,940, Cl. 40-140.000.
Miguel, Raul C.: *See—*
Gonzalez, Roland; and Miguel, Raul C., 4,037,069, Cl. 200-86.00R.
Mikuni Kogyo Kabushiki Kaisha: *See—*
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.
Miller, Edward C., to Ball Corporation. Bodymaker punch and ram. 4,036,047, Cl. 72-347.000.
Miller, Eugene F.: *See—*
Clark, Robert P.; and Miller, Eugene F., 4,036,421, Cl. 226-185.000.
Millipore Corporation: *See—*
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Millmaster Onyx Corporation: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,036,959, Cl. 424-248.560.
Miloradovic, Predrag; and Schaffhauser, Hans, to Gretag Aktiengesellschaft. Method and apparatus for adjusting and readjusting an automatic corrector for a data signal transmission system. 4,037,160, Cl. 325-42.000.
Milwaukee Valve Company, Inc.: *See—*
Robinson, Daniel T., 4,036,469, Cl. 251-306.000.
Mimitsuka, Takao; and Iwakawa, Tunekiyo, to Nippon Electric Company Limited. Gas discharge display device. 4,037,130, Cl. 313-220.000.
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich. Granulated zeolite catalyst and process for producing the catalyst. 4,036,782, Cl. 252-455.00Z.
Minami, Hidehiro: *See—*
Hata, Yoshitaka; Shioyama, Giichi; and Minami, Hidehiro, 4,036,015, Cl. 60-282.000.
Miner Enterprises, Inc.: *See—*
White, Clarence E., 4,036,149, Cl. 105-280.000.
Minerec Corporation: *See—*
Fraioli, Anthony V.; and DeRosa, John A., 4,036,634, Cl. 75-.50A.
Strow, Lawrence Evans; and Bolth, Franklin Anderson, 4,036,746, Cl. 209-166.000.
Minnesota Mining and Manufacturing Company: *See—*
Lee, Pui Kum; and Strehlow, Wolfgang H., 4,036,552, Cl. 350-97.000.
Mino, Masao, to Kabushiki Kaisha Mino Seisakusho. Grooved traverse drum for winder. 4,036,447, Cl. 242-43.200.
Minolta Camera Kabushiki Kaisha: *See—*
Ueda, Hiroshi, 4,037,235, Cl. 354-38.000.
Minorikawa, Kazuo, to Hitachi, Ltd. Counter. 4,037,085, Cl. 235-92.0LG.
Mintz, Marcus: *See—*
Engelhardt, Bernard H.; and Mintz, Marcus, 4,036,055, Cl. 73-312.000.
Miranda, Fernando. Fabric creasing machine. 4,036,414, Cl. 223-28.000.
Missbach, Gernot: *See—*
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Mitchell, John D.: *See—*
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Mitsubishi Chemical Industries Ltd.: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Kobayashi, Gai; and Shikano, Yoshiro, 4,036,291, Cl. 165-105.000.
Oda, Minoru; and Badono, Shinji, 4,037,099, Cl. 250-272.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Fujiyama, Susumu; Takagawa, Minoru; and Kajiyama, Shiro, 4,036,885, Cl. 260-599.000.
Togo, Shizuo; Ito, Muneo; Nishizawa, Chiharu; and Ohba, Michio, 4,036,861, Cl. 260-369.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Akiyama, Takayuki, 4,036,077, Cl. 74-526.000.
Taenzi, Igarashi; and Toshio, Tsubota, 4,036,373, Cl. 214-1.0BB.
Yahagi, Kyozo; and Yasukuni, Takashi, 4,036,276, Cl. 164-7.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Toyama, Teruhiko; and Takasawa, Yoshio, 4,036,630, Cl. 71-88.000.
Tsujimoto, Michihiro; and Okubo, Ichiro, 4,036,805, Cl. 260-37.00N.
Mitzlaff, Michael, to Hoechst Aktiengesellschaft. Process for preparing N-(α-alkoxyethyl)-carboxylic acid amides. 4,036,712, Cl. 204-59.00R.
Miyagishima, Tosh: *See—*
Mott, James D.; and Miyagishima, Tosh, 4,036,296, Cl. 166-322.000.
Miyatani, Akira: *See—*
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Miyazi, Kazumi: *See—*
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Mizoe, Yoji: *See—*
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Mlavsky, Abraham I., to Mobil Tyco Solar Energy Corporation. Manufacture of semiconductor ribbon. 4,036,666, Cl. 148-1.500.
Mobil Oil Corporation: *See—*
Espenscheid, Wilton F.; Offenhauer, Robert D.; and Yan, Tsoung Y., 4,036,770, Cl. 252-51.50R.
Okorodudu, Abraham O. M., 4,036,773, Cl. 252-56.00R.
Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,036,779, Cl. 252-417.000.
Strong, Jerry G., 4,036,629, Cl. 71-88.000.
Mobil Tyco Solar Energy Corporation: *See—*
Mlavsky, Abraham I., 4,036,666, Cl. 148-1.500.
Mochizuki, Kiyoshi: *See—*
Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi, 4,036,930, Cl. 264-167.000.
Moeckel, Peter, to Siemens Aktiengesellschaft. Arrangement for the direct conversion of items of data stored in magnetic form into optical signals. 4,037,263, Cl. 360-114.000.
Moeller, Rolf: *See—*
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Mohasco Corporation: *See—*
Cycowicz, Izchak; and Gill, Glenn G., 4,035,852, Cl. 5-13.000.
Mole, Cecil J.; and Haller, Henry E., III, to Westinghouse Electric Corporation. Dynamoelectric machine with a superconductive field winding that can operate in either a synchronous or an asynchronous mode. 4,037,123, Cl. 310-52.000.
Molex Incorporated: *See—*
Mysiak, Eugene J.; and Bury, Allen J., 4,036,545, Cl. 339-95.00D.
Molins Limited: *See—*
Davies, Robert W.; Thornton, Leonard; Veness, Maxwell F.; and Calver, Leonard H., 4,036,117, Cl. 93-51.00R.
Penzias, Rolf, 4,036,118, Cl. 93-77.0FT.
Preston, Edward G.; Rakowicz, Jan A.; and Labbe, Francis A. M., 4,036,239, Cl. 131-109.00R.
Moller, Jens C. T.; and Hansen, Ove E. Process for preparing paraformaldehyde. 4,036,891, Cl. 260-615.500.
Molpus, Homer B., to C & H Manufacturing Company. Stop means for mat board cutter. 4,036,486, Cl. 269-303.000.
Mombaecher, Ingolf, to Braas & Co. GmbH. Injection molding machine with feed control. 4,036,405, Cl. 222-63.000.
Mombaecher, Ingolf, to Braas & Co. GmbH. Injection molding machine with feed plunger in hopper. 4,036,410, Cl. 222-255.000.
Monahan, John F., to Harris Corporation. Automatic digital iris correction. 4,037,254, Cl. 358-228.000.
Monsanto Company: *See—*
Ambrose, Everett J., 4,036,364, Cl. 206-526.000.
Birum, Gail H., 4,036,913, Cl. 260-938.000.
Kauffman, Ivan L.; and Kellogg, Robert C., 4,036,573, Cl. 425-529.000.
Kauffman, Ivan L.; and Kellogg, Robert C., 4,036,925, Cl. 264-94.000.
McLane, Martin M.; and Newsom, Raymond A., 4,036,940, Cl. 423-503.000.
Stolki, Thomas J., 4,036,927, Cl. 264-97.000.
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Montbrun, Felix; and Liesenborghs, Roland. Apparatus for the continu-

ous application of a metallic coating to a metal strip. 4,037,074, Cl. 219-121.00P.

Montedison Fibre S.p.A.: *See*—
Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, 4,036,733, Cl. 208-12.000.
Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, 4,036,963, Cl. 424-258.000.
Ribaldone, Giuseppe; and Borsotti, Giampiero, 4,036,859, Cl. 260-364.000.

Moore, Bette J., personal representative: *See*—
Moore, Robert M., deceased; and Moore, Bette J., personal representative, 4,036,327, Cl. 184-55.00A.

Moore Business Forms, Inc.: *See*—
Maalouf, George E., 4,036,511, Cl. 282-27.500.

Moore, Freeman O., Jr.: *See*—
Pagano, Victor H.; and Moore, Freeman O., Jr., 4,036,104, Cl. 89-36.00H.

Moore, Robert A.; and Cooper, Herbert Warren, to Westinghouse Electric Corporation. Combined acoustic surface wave and semiconductor device particularly suited for signal convolution. 4,037,174, Cl. 333-30.00R.

Moore, Robert M., deceased; and by Moore, Bette J., personal representative. Air line lubricator with safety device. 4,036,327, Cl. 184-55.00A.

Moore, William J., to Forney Engineering Company. Flame detector. 4,037,113, Cl. 250-554.000.

Moosbrucker, Karl; and Rauch, Hans, to Josef Bautz GmbH. Hay harvesting machine for breaking up the cut grass. 4,035,992, Cl. 56-1.000.

Morais, Carroll F., to Acoustic Emission Technology Corporation. Automatic threshold control means and the use thereof. 4,036,057, Cl. 73-88.00R.

Morduchowitz, Abraham: *See*—
Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,766, Cl. 252-51.50A.
Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,767, Cl. 252-51.50A.

Morgan, Barry S.; and Sandell, Richard P., to Chevron Research Company. Fractionation tray with adjustable capacity weir means. 4,036,918, Cl. 261-114.00R.

Mori, Hiroshi, to Sony Corporation. Display apparatus. 4,036,551, Cl. 350-160.00R.

Mori, Yasuki: *See*—
Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,037,036, Cl. 526-46.000.

Morishita, Hirosada: *See*—
Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,037,036, Cl. 526-46.000.

Morita, Takayuki: *See*—
Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001, Cl. 57-52.000.

Moritz, Karl-Ludwig, to Bayer Aktiengesellschaft. Disazo dyestuffs containing A-O-alkylene-O-SO_3H group. 4,036,824, Cl. 260-186.000.

Morlet, Jean G.; Honnorat, Yves C.; and Raisson, Gerard D., to Creusot-Loire. Machines for manufacture of powders. 4,036,568, Cl. 425-8.000.

Morris, Glenn H. Safety closure for containers. 4,036,385, Cl. 215-209.000.

Morse California Co.: *See*—
Morse, Dwain E., 4,036,390, Cl. 220-5.00A.

Morse, Dwain E., to Morse California Co. Plastic tank panels and joint assembly. 4,036,390, Cl. 220-5.00A.

Mortikov, Evgeny Sergeevich: *See*—
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Morton-Norwich Products, Inc.: *See*—
Goldenberg, Marvin M., 4,036,981, Cl. 424-285.000.
Steger, John F., 4,037,019, Cl. 428-469.000.

Mosciano, Gerard Joseph: *See*—
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886, Cl. 260-599.000.

Moser, Peter: *See*—
Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl. 210-168.000.

Moss, Ernest K., to Celotex Corporation, The. Phenolic polymer, related products and processes thereof. 4,036,793, Cl. 260-2.50F.

Motoren- und Turbinen-Union Munchen GmbH: *See*—
Fehler, Adolf; and Kirschey, Gunter, 4,036,582, Cl. 431-352.000.

Motoren-Werke Mannheim AG: *See*—
Hubschmann, Karl-Wolfgang, 4,036,112, Cl. 92-80.000.

Motorola, Inc.: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.
Eastmond, Bruce Charles, 4,037,158, Cl. 325-22.000.
Hoffman, Charles R.; and Powell, Michael W., 4,037,243, Cl. 357-23.000.

Mott, James D.; and Miyagishima, Tosh, to Hydril Company. Subsurface well apparatus. 4,036,296, Cl. 166-322.000.

Mourning, Michael C.: *See*—
Viro, Felix; and Mourning, Michael C., 4,036,643, Cl. 96-29.00D.

Moyer, John H.: *See*—
Kaufman, Harold B., Jr.; Moyer, John H.; and McCarthy, John P., 4,037,071, Cl. 219-10.55F.

Muehling, Anthony A. Brake pedal positioning mechanism. 4,036,078, Cl. 74-529.000.

Mueller, Herbert: *See*—
Voges, Dieter; Winderl, Siegfried; and Mueller, Herbert, 4,036,883, Cl. 260-585.00B.

Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gonsior, Leonhard; and Gruber, Wolfgang, to BASF Aktiengesellschaft. Manufacture of olefin polymers. 4,037,042, Cl. 526-106.000.

Mueller, Willy, to Compur-Werk Gesellschaft mit beschrankter Haftung & Co. Automatic telephone answering apparatus. 4,037,053, Cl. 179-6.00R.

Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, to Mikuni Kogyo Kabushiki Kaisha. Lubricating oil pump. 4,036,326, Cl. 184-27.00R.

Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, to Hitachi, Ltd. 9-(p-Vinylphenyi)-acridine polymers. 4,037,036, Cl. 526-46.000.

Mulder, Albertus J.: *See*—
Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., 4,036,887, Cl. 260-599.000.

Mulder, H. Christopher: *See*—
Marrotte, Gary J.; and Mulder, H. Christopher, 4,036,102, Cl. 89-33.0BB.

Muller, Marcel: *See*—
Alig, Leo; Furst, Andor; and Muller, Marcel, 4,036,874, Cl. 260-488.00B.

Muller, Reinhard: *See*—
Beriger, Conrad; and Muller, Reinhard, 4,037,045, Cl. 174-15.00R.

Muller, Rolf: *See*—
Raible, Hermann; and Muller, Rolf, 4,036,135, Cl. 101-463.000.

Multinorm, B.V.: *See*—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,035,991, Cl. 56-1.000.

Munsch, Daniel. Fishing rod appliance. 4,036,368, Cl. 211-60.00R.

Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method of manufacturing resin tubes alternately having a thick wall portion and a thin wall portion. 4,036,930, Cl. 264-167.000.

Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, to Yamanouchi Pharmaceutical Co., Ltd. Derivatives of 7-(α-hydroxy-substituted pyridyl carboxamido-α phenyl-acetamido-3-substituted thio methyl Δ^3-cephem-4-carboxylic acid. 4,036,834, Cl. 260-243.00C.

Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, to Yamanouchi Pharmaceutical Co., Ltd. Stable prostaglandin E group-containing formulation. 4,036,954, Cl. 424-176.000.

Muramatu, Yukihiko: *See*—
Numata, Kenichi; and Muramatu, Yukihiko, 4,036,191, Cl. 123-119.00A.

Murano, Hatsuo: *See*—
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.

Murata Manufacturing Co., Ltd.: *See*—
Ieki, Hideharu; Ishiyama, Hideki; and Inoue, Atushi, 4,037,181, Cl. 333-72.000.
Nakamura, Takeshi; and Nishiyama, Hiroshi, 4,037,121, Cl. 310-8.200.
Tamada, Minoru; Shikama, Takashi; and Nakamura, Toshikazu, 4,037,082, Cl. 219-541.000.

Murayama, Hideo: *See*—
Matsushita, Katsuyuki; Murayama, Hideo; Yawata, Kazufumi; and Kobayakawa, Masaki, 4,035,885, Cl. 29-25.140.

Murphy, Charles Allen: *See*—
Atkins, James Damon; Murphy, Charles Allen; and Stotts, Lewis Everett, 4,037,213, Cl. 364-200.000.

Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., to Congoleum Corporation. Method for installing surface covering or the like. 4,036,673, Cl. 156-71.000.

Murray, James T.: *See*—
Rabehl, Kenneth R., 4,036,320, Cl. 180-5.00R.

Murray, Joseph E., Jr. Smoking apparatus with replaceable filtering cartridge. 4,036,240, Cl. 131-173.000.

Mussgay, Manfred: *See*—
Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, 4,036,952, Cl. 424-89.000.

Myers, Hugh T., Sr.: *See*—
Gardner, Patrick J.; and Myers, Hugh T., Sr., 4,035,868, Cl. 17-21.000.

Mysiak, Eugene J.; and Bury, Allen J., to Molex Incorporated. Connector assembly. 4,036,545, Cl. 339-95.00D.

N-Dimensions, Inc.: *See*—
Walker, Alexander D. R., 4,036,067, Cl. 74-112.000.

Nachtigall, Walter E., Jr., to Palm Brothers, Incorporated. Hot shelf assembly. 4,036,401, Cl. 221-150.00A.

Nadj, Henriette: *See*—
Pierre, Kenneth Jonas; Tung, Ker-Kong; and Nadj, Henriette, 4,036,697, Cl. 195-99.000.

Nagai, Yoshitaka: *See*—
Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl. 128-4.000.

Nagano, Syuji: *See*—
Onuma, Kiyoshi; and Nagano, Syuji, 4,036,081, Cl. 74-781.00R.
Nagano, Yoshinobu: *See*—
Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.
Nagao, Yoshiro: *See*—
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.
Nagaoka, Tadashi, to Matsushita Electric Industrial Co., Ltd. Pressure sensitive signal reproducing system for a videodisc. 4,037,253, Cl. 358-128.000.
Nagasawa, Yoshio: *See*—
Ikuta, Hiroaki; Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, 4,037,211, Cl. 364-200.000.
Nagashima, Takashi: *See*—
Kondo, Toshiyuki; and Nagashima, Takashi, 4,036,534, Cl. 303-6.00R.
Nagayoshi, Konno. Coke oven sealing apparatus. 4,036,702, Cl. 202-248.000.
Nahay, Lawrence P., to United States of America, Navy. 20 HZ Ringdown solid state two-wire/four-wire converter. 4,037,065, Cl. 179-170.0NC.
Nakagawa, Tsugumichi: *See*—
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.
Nakaguti, Osamu: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.
Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, to FMC Corporation. Method of increasing the rate of solubility of materials of low solubility. 4,036,990, Cl. 424-361.000.
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, to Fujitsu Ltd. Data processing system for converting from logical addresses to physical addresses. 4,037,209, Cl. 364-200.000.
Nakajima, Saburo: *See*—
Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl. 58-85.500.
Nakajima, Shin'Ichiro: *See*—
Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, 4,036,990, Cl. 424-361.000.
Nakamoto, Soichi: *See*—
Tunekawa, Tokuichi; Nakamoto, Soichi; and Taguchi, Tetsuya, 4,037,234, Cl. 354-24.000.
Nakamura, Hideo: *See*—
Sato, Teruo; and Nakamura, Hideo, 4,037,055, Cl. 179-15.0BT.
Nakamura, Hitoshi: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.
Nakamura, Takeshi; and Nishiyama, Hiroshi, to Murata Manufacturing Co., Ltd. Piezoelectrically driven tuning fork with harmonic suppression. 4,037,121, Cl. 310-8.200.
Nakamura, Toshikazu: *See*—
Tamada, Minoru; Shikama, Takashi; and Nakamura, Toshikazu, 4,037,082, Cl. 219-541.000.
Nakanishi, Yoshitaka. Sash lock. 4,036,039, Cl. 70-90.000.
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, to Sekisui Kagaku Kogyo Kabushiki Kaisha; and Tomoegawa Paper Co., Ltd. Method for producing thermoplastic resin films or sheets for chelate color printing. 4,037,004, Cl. 427-145.000.
Nakayama, Kenji, to Diesel Kiki Co. Engine fuel injection system. 4,036,192, Cl. 123-139.0AT.
Nakazato, Tetsuo; Kamon, Shunji; Tokuda, Koichi; and Honma, Keisuke, to Sumitomo Bakelite Company, Limited. Apparatus for sealing the heads of containers. 4,035,987, Cl. 53-133.000.
Nanao, Teruaki: *See*—
Yoshimori, Ikuo; Nanao, Teruaki; and Sugino, Toshio, 4,036,248, Cl. 137-271.000.
Narahara, Hisaaki: *See*—
Tanaka, Yoshinori; and Narahara, Hisaaki, 4,037,247, Cl. 358-4.000.
Narita, Shigeyoshi: *See*—
Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
Naruke, Yoshikazu: *See*—
Ikuta, Hiroaki; Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, 4,037,211, Cl. 364-200.000.
Nash Metalware Co. Inc.: *See*—
Eisenberg, Stephanie, 4,036,369, Cl. 211-88.000.
National Controls, Inc.: *See*—
Rock, Frank C., 4,036,316, Cl. 177-1.000.
National Research Development Corporation: *See*—
Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592, Cl. 23-232.00E.
National Semiconductor Corporation: *See*—
Allen, Robert M.; and Seyffert, Michael, 4,036,725, Cl. 204-206.000.
National Steel Corporation: *See*—
Saunders, William T., 4,036,056, Cl. 72-329.000.
National Upper Cervical Chiropractic Research Association, Inc.: *See*—
Gregory, Ralph R., 4,036,213, Cl. 128-2.08S.
Nauta, Robin Gustav, to Dorr-Oliver Incorporated. Fluid bed incinerator feed system. 4,036,153, Cl. 110-8.00F.
NCR Corporation: *See*—
Betts, William L.; and Greene, Robert T., 4,037,226, Cl. 340-347.0DD.
Neal, Wayne Ray: *See*—
Owens, Michael; and Neal, Wayne Ray, 4,037,148, Cl. 323-17.000.
Neff, Gregor N. Collection and feeding of insects to animals. 4,036,189, Cl. 119-51.00R.
Neilsen, Hildaur L., to Rolodex Corporation. Rotary card holder. 4,035,938, Cl. 40-68.600.
Neiman, Michel, to Societe de Diffusion Neiman. Cap for a fuel tank. 4,036,393, Cl. 220-206.000.
Nekrutman, Samuil Veniaminovich: *See*—
Kirpichnikov, Vladimir Pavlovich; Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich, 4,037,070, Cl. 219-10.55A.
Nelson, Gerald H.: *See*—
Mickey, Edgar G.; and Nelson, Gerald H., 4,035,940, Cl. 40-140.000.
Nemec, Allen R.: *See*—
Chamran, Morteza M.; and Nemec, Allen R., 4,037,154, Cl. 324-123.00R.
Nephew, O. Thomas: *See*—
Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, 4,036,372, Cl. 212-144.000.
Nethercutt, Henry W.; and Lambiotte, Edward J. Syringe destroyer with needle disposing cannister. 4,035,911, Cl. 30-131.000.
Neufang, Karlheinz, to Siemens Aktiengesellschaft. Circuit arrangement for monitoring PCM couplers. 4,037,054, Cl. 179-15.0BF.
Neumann, Peter, to Sandoz, Inc. Substituted imidazolinylaminoindazoles. 4,036,976, Cl. 424-273.000.
Neuzil, Richard W.: *See*—
Rosback, Donald H.; and Neuzil, Richard W., 4,036,744, Cl. 208-310.00Z.
Neveux, Rene, to Societe Anonyme Francaise du Ferodo. Radiator, especially for the air-conditioning system of an automobile. 4,036,288, Cl. 165-69.000.
Newman, Albert L.: *See*—
Bajorek, Jay E.; and Newman, Albert L., 4,035,978, Cl. 52-727.000.
Newman, Gerald R. Random motion fish lure apparatus and methods. 4,035,945, Cl. 43-42.150.
Newman-Green, Inc.: *See*—
Green, Elward Howard, 4,036,439, Cl. 239-466.000.
Newnom, Richard S., to Amerace Corporation. Apparatus for making self-locking internally threaded fasteners with ring-like locking elements. 4,035,859, Cl. 10-72.00R.
Newsom, Raymond A.: *See*—
McLane, Martin M.; and Newsom, Raymond A., 4,036,940, Cl. 423-503.000.
Newson, John Chase, to Westinghouse Brake & Signal Co. Ltd. Driving and locking mechanisms. 4,035,956, Cl. 49-280.000.
NFE International, Ltd.: *See*—
DeMarco, Thomas M., 4,036,614, Cl. 55-310.000.
NGK Insulators, Ltd.: *See*—
Majima, Tsuyoshi; and Hara, Katsunosuke, 4,036,753, Cl. 210-63.00R.
Nicholas, John F., to General Electric Company. Automatic gain control circuit. 4,037,163, Cl. 328-175.000.
Nichols, Richard D. E.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,035,902, Cl. 29-446.000.
Nicholson, John S.: *See*—
Armitage, Bernard J.; and Nicholson, John S., 4,036,989, Cl. 424-353.000.
Nicklas, Manfred E. Internal coating and sandblasting bug for pipe. 4,036,173, Cl. 118-306.000.
Nico-Pyrotechnik Hanns-Juergen Diederichs KG.: *See*—
Luebbers, Willi, 4,036,145, Cl. 102-73.00R.
Nicolaus, Frank G.: *See*—
Breitenstein, Charles T.; and Nicolaus, Frank G., 4,036,242, Cl. 133-4.00R.
Nidola, Antonio; de Nora, Vittorio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Electric storage battery with valve metal electrodes. 4,037,032, Cl. 429-198.000.
Nielsen, Knud. Child's chair. 4,036,523, Cl. 297-130.000.
Nielsen, Thomas Christian; and Sirico, James Louis, to International Business Machines Corporation. Apparatus for transferring sample holders relative to a movable magazine. 4,036,381, Cl. 214-310.000.
Nieman, John R., to Caterpillar Tractor Co. Method of treating molten metal in centrifugal castings. 4,036,279, Cl. 164-57.000.
Nihon Denshi Kabushiki Kaisha: *See*—
Okumura, Kimio; Soya, Tatsunori; Kauchi, Yosuke; and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000.
Nijman, John Peter, to Bunker Ramo Corporation. Electrical connector having an elongate rear slot communicating with conductor receiving channels via conductor receiving and holding notches. 4,036,547, Cl. 339-99.00R.
Niki, Hirokazu: *See*—
Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.
Nippon Atsudenki Kabushiki Kaisha t/a Japan Piezo Co., Ltd.: *See*—
Uchida, Ryuichi; Terasaki, Kaoru; and Ogikubo, Masaru, 4,037,060, Cl. 179-100.41K.
Nippon Electric Company Limited: *See*—
Iijima, Yukihiko; and Ishiguro, Tatsuo, 4,037,248, Cl. 358-13.000.

Katoh, Hidehiko; Kajiwara, Yuji; and Takamizawa, Hideo, 4,037,168, Cl. 330-31.000.
Mimitsuka, Takao; and Iwakawa, Tunekiyo, 4,037,130, Cl. 313-220.000.
Nippon Electric Kagoshima, Ltd.: *See*—
Matsushita, Katsuyuki; Murayama, Hideo; Yawata, Kazufumi; and Kobayakawa, Masaki, 4,035,885, Cl. 29-25.140.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ogita, Minoru; and Hoshi, Juro, 4,037,057, Cl. 179-15.0BT.
Ogita, Minoru, 4,037,165, Cl. 329-124.000.
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,036,096, Cl. 84-1.010.
Yokoyama, Kenji, 4,037,166, Cl. 330-13.000.
Nippon Kogaku K.K.: *See*—
Maida, Osamu, 4,036,555, Cl. 352-169.000.
Nippon Mining Co., Ltd.: *See*—
Ozaki, Hiromi; Yamane, Mamoru; Yoshikai, Haruo; and Kodama, Hachio, 4,036,736, Cl. 208-106.000.
Nippon Oil Co., Ltd.: *See*—
Tsuchiya, Shozo, 4,037,038, Cl. 526-56.000.
Nippon Paint Co., Ltd.: *See*—
Hirai, Seizaburo; Mizoe, Yoji; and Koji, Itoh, 4,036,804, Cl. 260-29.7SQ.
Kato, Hisao; Yagi, Hideo; and Fukuta, Shunji, 4,036,721, Cl. 204-181.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,036,780, Cl. 252-437.000.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,036,186, Cl. 123-32.0EA.
Igashira, Toshihiko; Yamaguchi, Shunzo; and Hujita, Masami, 4,036,183, Cl. 123-8.130.
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,036,180, Cl. 123-3.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 4,037,230, Cl. 346-75.000.
Nippondenso Co., Ltd.: *See*—
Kobayashi, Hisanori, 4,036,194, Cl. 123-139.0AW.
Kondo, Yoshihiko, 4,037,146, Cl. 318-444.000.
Numata, Kenichi; and Muramatu, Yukihiko, 4,036,191, Cl. 123-119.00A.
Nishi, Takayuki: *See*—
Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, 4,036,042, Cl. 72-9.000.
Nishio, Akira: *See*—
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.
Nishio Takuji, to Tokyo Kosei Kaken Co. Ltd. Mobile floor cleaning and polishing device. 4,035,958, Cl. 51-425.000.
Nishioka, Kunihiko: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000.
Nishioka, Masato; and Carter, Daniel Dulaney, to Procter & Gamble Company, The. Venting closure assembly. 4,036,386, Cl. 215-260.000.
Nishiyama, Hiroshi: *See*—
Nakamura, Takeshi; and Nishiyama, Hiroshi, 4,037,121, Cl. 310-8.200.
Nishizawa, Chiharu: *See*—
Togo, Shizuo; Ito, Muneo; Nishizawa, Chiharu; and Ohba, Michio, 4,036,861, Cl. 260-369.000.
Nissan Chemical Industries, Ltd.: *See*—
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.
Nissan Motor Co., Ltd.: *See*—
Ariga, Hajime, 4,036,014, Cl. 60-274.000.
Hata, Yoshitaka; Shioyama, Giichi; and Minami, Hidehiro, 4,036,015, Cl. 60-282.000.
Katoh, Sadao, 4,036,535, Cl. 303-6.00C.
Nixon, Ralph Alan, to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, The. Underwater anchoring apparatus. 4,036,161, Cl. 114-296.000.
Nizhensky, Anatoly Danilovich: *See*—
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.
Noble, Roger K.: *See*—
Reed, Robert D.; Schwartz, Robert E.; and Noble, Roger K., 4,036,580, Cl. 431-202.000.
Noctua, Inc.: *See*—
Christensen, Craig M., 4,036,557, Cl. 356-28.000.
Noetzel, Siegfried; and Herwig, Walter, to Hoechst Aktiengesellschaft. Flame retarding polyamide molding compositions. 4,036,811, Cl. 260-45.75W.
Nogaj, Alfred: *See*—
Lohwasser, Hermann; Nogaj, Alfred; and Reinehr, Ulrich, 4,035,884, Cl. 28-281.000.
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming system for an internal combustion engine. 4,036,180, Cl. 123-3.000.
Noguchi, Masataka: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000.
Noiles, Douglas G.: *See*—
Veth, George J.; and Noiles, Douglas G., 4,036,211, Cl. 128-2.00R.
Nolan, John F.: *See*—
Clem, William E.; and Nolan, John F., 4,035,986, Cl. 53-61.000.
Nolan, John M., to General Electric Company. Multiple-plate clutch. 4,036,344, Cl. 192-48.300.
Noltemeyer, Friedrich: *See*—
Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl. 210-168.000.
Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, to Hitachi, Ltd. Information processing system. 4,037,212, Cl. 364-200.000.
Nomura, Yazyuro: *See*—
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Nordgren, John Lennart; and Thordarson, Gunnar Gudmund, to U.S. Philips Corporation. Impact contact device for projectiles. 4,036,143, Cl. 102-70.20R.
Nordstrom, Harold A.: *See*—
Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 4,036,992, Cl. 426-3.000.
Norton Company: *See*—
Pemrick, Raymond E.; and Cocanour, Paul M., 4,035,961, Cl. 51-295.000.
Novey, William E., to Eli Bridge Company. Solid state timer-stepper with soft switch-on and switch-off load control. 4,037,135, Cl. 315-194.000.
Novinson, Thomas: *See*—
O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., 4,036,840, Cl. 260-256.50R.
Nuclear Battery Corporation: *See*—
Barr, Harold N.; Lyon, Warren Charles; and Bustard, Thomas S., 4,036,665, Cl. 136-202.000.
Nuclear Power Company Limited: *See*—
Rickard, Allan Robert; and George, Brian Victor, 4,036,687, Cl. 176-37.000.
Nucleonic Data Systems, Inc.: *See*—
Allport, John J., 4,037,104, Cl. 250-359.000.
Nugent, John W.: *See*—
Ennis, George E.; Ennis, George Thomas; and Nugent, John W., 4,035,862, Cl. 15-53.0AB.
Numata, Kenichi; and Muramatu, Yukihiko, to Nippondenso Co., Ltd. Exhaust gas recirculation system. 4,036,191, Cl. 123-119.00A.
Numata, Saburo; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd. Switching circuit for electric shutter. 4,037,236, Cl. 354-51.000.
Nya Asfalt AB: *See*—
Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.
Nyholm, Jarl. Shop scales with digital weight indication. 4,036,318, Cl. 177-211.000.
Oakland, John Stephen: *See*—
Mercer, Alec Victor; and Oakland, John Stephen, 4,036,851, Cl. 260-310.00D.
Oberg, Gary R., to Berkley & Company, Inc. Water ski safety flag. 4,035,856, Cl. 9-313.000.
Obert, Jean-Claude. Apparatus for generating aerosols of solid particles. 4,036,223, Cl. 128-266.000.
O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., to ICN Pharmaceuticals. 2-Substituted-s-triazolo[1,5*a*]pyrimidines. 4,036,840, Cl. 260-256.50R.
Occidental Oil Shale, Inc.: *See*—
Cha, Chang Yul; and Ridley, Richard D., 4,036,299, Cl. 166-261.000.
French, Gordon B., 4,036,099, Cl. 86-20.00C.
Occidental Petroleum Corporation: *See*—
Gundzik, Richard M.; and Logan, Forrest E., 4,036,608, Cl. 55-89.000.
Ochiai, Yoshinori: *See*—
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.
Oda, Minoru; and Badono, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent X-ray sulfur analyzer. 4,037,099, Cl. 250-272.000.
Odell, Jack L.: *See*—
Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,037,189, Cl. 340-6.00R.
Oden, Kenneth W., to Dixie-Narco, Inc. Tandem column vender anti theft device. 4,036,400, Cl. 221-67.000.
O'Donnell, Phillip P.: *See*—
Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,036,726, Cl. 204-231.000.
Offenhauer, Robert D.: *See*—
Espenscheid, Wilton F.; Offenhauer, Robert D.; and Yan, Tsoung Y., 4,036,770, Cl. 252-51.50R.
Offerdahl, Richard E.: *See*—
Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.
Officine Galileo Meccanotessile S.p.A.: *See*—
Santi, Luciano, 4,036,267, Cl. 139-336.000.

Ogawa, Masayuki: *See*—
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.
Ogikubo, Masaru: *See*—
Uchida, Ryuichi; Terasaki, Kaoru; and Ogikubo, Masaru, 4,037,060, Cl. 179-100.41K.
Ogita, Minoru; and Hoshi, Juro, to Nippon Gakki Seizo Kabushiki Kaisha. Noise-cancelling apparatus for FM stereo receiver. 4,037,057, Cl. 179-15.0BT.
Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Synchronous signal generating system with phase-locked loop circuit. 4,037,165, Cl. 329-124.000.
Ogoshi, Toshiaki; Miyawaki, Yozo; Kondo, Fusao; and Sakurai, Susumu, to Lion Fat & Oil Co., Ltd. Apparatus for continuous sulfonation. 4,036,596, Cl. 23-283.000.
Ohba, Michio: *See*—
Togo, Shizuo; Ito, Muneo; Nishizawa, Chiharu; and Ohba, Michio, 4,036,861, Cl. 260-369.000.
Ohi, Hideyuki: *See*—
Okumura, Kimio; Soya, Tatsunori: Kauchi, Yosuke; and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000.
Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.
Ohmae, Tsutomu; Yano, Hideo; and Suzuki, Toshio, to Agency of Industrial Science & Technology. Control device for use in shunt motor. 4,037,144, Cl. 318-338.000.
Ohmura, Hidemasa: *See*—
Matsuda, Kazuo; Ohmura, Hidemasa; and Sakai, Takeyo, 4,036,801, Cl. 260-29.2TN.
Oil-Dri Corporation of America: *See*—
Valenta, Rudolph C., 4,036,928, Cl. 264-118.000.
Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, to Kobe Steel Ltd. Process for welding aluminum and aluminum alloys in horizontal welding position. 4,037,078, Cl. 219-137.00R.
Okamoto, Masaharu: *See*—
Matsumoto, Kuniaki; Hatakeyama, Junichi; and Okamoto, Masaharu, 4,036,023, Cl. 61-25.000.
Okamoto, Shigekatu: *See*—
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,036,955, Cl. 424-177.000.
Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Electronic timepiece. 4,036,008, Cl. 58-85.500.
Okazaki, Kiyoshi: *See*—
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,036,954, Cl. 424-176.000.
Okorodudu, Abraham O. M., to Mobil Oil Corporation. Lubricant compositions containing carboxylic acid esters of hindered hydroquinones. 4,036,773, Cl. 252-56.00R.
Oku, Teruo: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.
Okubo, Ichiro: *See*—
Tsujimoto, Michihiro; and Okubo, Ichiro, 4,036,805, Cl. 260-37.00N.
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Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl. 219-137.00R.
Okumoto, Yutaka, to Japan Tobacco & Salt Public Corporation, The. Apparatus for controlling amount of tobacco filler in cigarette manufacturing machine. 4,036,238, Cl. 131-21.00B.
Okumura, Kimio; Soya, Tatsunori; Kauchi, Yosuke; and Ohi, Hideyuki, to Agency of Industrial Science & Technology; and Nihon Denshi Kabushiki Kaisha. Method and apparatus for analyzing fine grained substances. 4,037,101, Cl. 250-310.000.
Okumura, Takatoshi: *See*—
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,036,096, Cl. 84-1.010.
Oldershaw, Reginald W.: *See*—
Busby, Edwin S., Jr.; and Oldershaw, Reginald W., 4,037,260, Cl. 360-73.000.
Oldham, Edwin W.: *See*—
Barnes, J. Haywood, 4,036,442, Cl. 241-82.500.
Oldham, Frank. Sand dispensing device for a motor vehicle. 4,036,516, Cl. 291-38.000.
Oldham, Vern L.: *See*—
Barnes, J. Haywood, 4,036,442, Cl. 241-82.500.
Olin Corporation: *See*—
Watson, W. Gary; and Breedis, John F., 4,036,642, Cl. 75-164.000.
Olson, David E.: *See*—
Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,037,189, Cl. 340-6.00R.
Olson, Steven W. Headset hanger. 4,036,464, Cl. 248-309.00R.
Olstowski, Franciszek, to Dow Chemical Company, The. Non-catalytic process for preparing rapid-setting rigid polyurethanes. 4,036,820, Cl. 260-77.5AM.
Olympus Optical Co., Ltd.: *See*—
Kabayashi, Minoru; and Miyazi, Kazumi, 4,037,262, Cl. 360-96.000.
Matsuda, Hironobu, 4,035,899, Cl. 29-773.000.
Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl. 128-4.000.
O'Mahony, John P.: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,036,996, Cl. 426-254.000.
Omnitech Inc.: *See*—
Laliberte, Albert J.; and DeAngelis, Armand, 4,036,168, Cl. 118-8.000.
Ono, Shusuke; Wasa, Kiyotaka; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Multi-layered substrate for a surface-acoustic-wave device. 4,037,176, Cl. 333-30.00R.
Onuma, Kiyoshi; and Nagano, Syuji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Overdrive mechanism for automotive power transmission. 4,036,081, Cl. 74-781.00R.
Onuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Overdrive device. 4,036,082, Cl. 74-781.00R.
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm, B.V. Device for mowing and subsequently crushing crop. 4,035,991, Cl. 56-1.000.
Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., to Akzona Incorporated. Novel chlorinated dicumene initiators. 4,036,898, Cl. 260-649.00R.
Optical Associates, Inc.: *See*—
Alexander, Merwin K.; Meyer, Daniel J.; and Cohen, Philip, 4,036,459, Cl. 248-11.000.
Optograms, Inc.: *See*—
von Voros, Geza, 4,035,922, Cl. 33-143.00L.
Orgill, Rodney H.: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.
Orita, Nobuhiro; Yabe, Koichi; and Kawanami, Akifumi, to Kurita Water Industries Ltd. Method of treating water containing chromate. 4,036,751, Cl. 210-35.000.
Orndorff, Roy Lee, Jr., to B. F. Goodrich Company, The. Pneumatic lifting device. 4,036,472, Cl. 254-93.0HP.
Ornelius, Erik Vilhelm Bernhard: *See*—
Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.
Osaka, Shigemi: *See*—
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,036,780, Cl. 252-437.000.
Osborne, Thomas E.; and Stockwell, Richard Kent, to Hewlett-Packard Company. Calculator having preprogrammed user-definable functions. 4,037,092, Cl. 235-156.000.
Osborne, William Steese: *See*—
Birney, Richard Eugene; Osborne, William Steese; and Graybiel, Lynn Allan, 4,037,207, Cl. 364-200.000.
Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215, Cl. 364-200.000.
Oshikiri, Tatsuo, to Kabushiki Kaisha Oshikiri Kikai Seisaku-Sho. Full-automatic panning system for white bread production line. 4,036,569, Cl. 425-140.000.
Osterlund, Alfred G.; and Ruble, Frank D., to Xerox Corporation. Hammer intensity selection apparatus for serial printer. 4,037,208, Cl. 364-900.000.
Otaco Limited: *See*—
Faul, Thomas L., 4,036,527, Cl. 297-454.000.
Ototani, Tohei; and Kataura, Yasuji, to Ototani, Tohei. Composite calcium clad material for treating molten metals. 4,035,892, Cl. 428-576.000.
Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Yamaguchi, Hideo; Kume, Hidetoshi; and Shibuta, Osamu, 4,036,936, Cl. 423-407.000.
Outboard Marine Corporation: *See*—
Lassanske, George G., 4,036,075, Cl. 74-409.000.
Maier, Daniel F.; and Sheldon, John D., 4,036,162, Cl. 115-17.000.
Over, William Roderick; and Brehm, Ronald Carl, to AMP Incorporated. Apparatus for connecting conductors to contact terminals in an electrical connector. 4,035,897, Cl. 29-56.600.
Owan, Vernon L. Portable jack. 4,036,474, Cl. 254-124.000.
Owen, Donald R. Protection and control of electric immersion-type heater. 4,037,080, Cl. 219-328.000.
Owens-Corning Fiberglas Corporation: *See*—
Foley, Kevin M.; Bell, Reuben H.; and McCombs, Frank P., 4,036,806, Cl. 260-37.00N.
Thomson, Francis D., 4,036,790, Cl. 260-2.5AQ.
Owens-Illinois, Inc.: *See*—
Amberg, Stephen W.; and Landers, Frank S., 4,036,675, Cl. 156-245.000.
Chang, Long Fei, 4,036,926, Cl. 264-94.000.
Owens, James H.: *See*—
Kirkland, Kerry G.; Masciopinto, Anthony J.; and Owens, James H., 4,036,295, Cl. 166-.600.
Owens, Michael; and Neal, Wayne Ray, to General Electric Company. Ballast control device. 4,037,148, Cl. 323-17.000.
Oxirane Corporation: *See*—
Kornfeld, Alan D., 4,036,905, Cl. 260-682.000.
Ozaki, Hiromi; Yamane, Mamoru; Yoshikai, Haruo; and Kodama,

Hachio, to Nippon Mining Co., Ltd. Process for producing synthetic coking coal and treating cracked oil. 4,036,736, Cl. 208-106.000.

Ozawa, Kiyomi: *See—*
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.

P. R. Mallory & Co., Inc.: *See—*
Dey, Arabinda N., 4,035,909, Cl. 29-623.200.
Dey, Arabinda N.; and Schlaikjer, Carl R., 4,037,025, Cl. 429-29.000.
Frey, Robert L.; and George, Lee R., 4,037,188, Cl. 338-174.000.

Pacific Erectors Corporation: *See—*
Tuckey, James C., 4,036,395, Cl. 220-224.000.

Packer, David H.: *See—*
Bertozzi, Eugene R.; Barclay, Robert, Jr.; Packer, David H.; and Smith, Daniel J., 4,036,882, Cl. 260-584.00B.

Paffoni, Camillo: *See—*
Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, 4,036,733, Cl. 208-12.000.

Pagano, Victor H.; and Moore, Freeman O., Jr., to United States of America, Army. Lightweight method of construction for ribbed applique armor. 4,036,104, Cl. 89-36.00H.

Pages, Michel: *See—*
Bardonnet, Claude; Brun, Robert; and Pages, Michel, 4,036,760, Cl. 210-323.00R.

Pagny, Georges Claude Andre: *See—*
Goujon, Roger Hubert; Menard, Jacques Pierre Raymond Raphael; and Pagny, Georges Claude Andre, 4,037,156, Cl. 324-158.00R.

Pallos, Ferenc M.; and Baker, Don R., to Stauffer Chemical Company. Phosphorus containing herbicide antidotes. 4,036,628, Cl. 71-86.000.

Palm Brothers, Incorporated: *See—*
Nachtigall, Walter E., Jr., 4,036,401, Cl. 221-150.00A.

Palmer, James E.; Lavallee, Donald C.; and Huber, George, to Spectron Corporation. Connecting and switching system, and switching apparatus suitable for use therein. 4,037,186, Cl. 335-206.000.

Panafacom Limited: *See—*
Ikuta, Hiroaki; Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, 4,037,211, Cl. 364-200.000.

Panchishin, July Modestovich: *See—*
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.

Papko, Tamara Stepanovna: *See—*
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Papst, Hermann Ernst Robert. Assembly for the damping of flexural and torsional vibration in the shafts of machines. 4,036,030, Cl. 64-1.00V.

Parc, Guy: *See—*
Denis, Jacques; and Parc, Guy, 4,036,771, Cl. 252-56.00R.

Pardee, Marilynn. Mattress cover. 4,035,854, Cl. 5-334.00C.

Parlee-Anderson Corporation: *See—*
Anderson, Robert N.; and Parlee, Norman A., 4,036,637, Cl. 75-84.000.

Parlee, Norman A.: *See—*
Anderson, Robert N.; and Parlee, Norman A., 4,036,637, Cl. 75-84.000.

Parrott, Orville C.: *See—*
Bennett, Robert L.; Parrott, Orville C.; Getzin, Allan R.; and McClain, A. Ervin, 4,036,611, Cl. 55-149.000.

Patchornik, Avraham; and Kraus, Menahem A., to Yeda Research & Development Co. Ltd. Novel method of organic synthesis to form a polymer-bound active species. 4,037,037, Cl. 526-46.000.

Pate, Harold T.; and Borsh, Richard J., to Indian Head Inc. Retainer clip and synthetic resin box combination. 4,036,389, Cl. 220-3.800.

Patel, Padma Ambalal; and Baker, Dennis Stanley, to Glacier Metal Company Limited, The. Bearing material. 4,036,822, Cl. 260-79.000.

Patil, Arvind S.; and Weissman, Eugene Y. Diaphragms from discrete thermoplastic fibers requiring no bonding or cementing. 4,036,729, Cl. 204-296.000.

Paton, Robert Michael: *See—*
Crosby, John; Rennie, Robert Allan Campbell; and Paton, Robert Michael, 4,035,869, Cl. 260-453.0AP.

Paules, Eugene H., to ExCel Engineering, Inc. Automatic vacuum packaging machine and method. 4,035,982, Cl. 53-22.00B.

Paulson, Roger A.: *See—*
Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.

Peace Medical: *See—*
Fegan, Frank Joseph; and Smith, William Harold, 4,036,253, Cl. 137-556.000.

Pearce, Jai K.; and Wells, William, to Pennsylvania Engineering Corporation. Steel converter vessel tuyere block construction. 4,036,481, Cl. 266-222.000.

Pearson, Walter B., to Hayes International Corporation. System for augmenting the visual and radar characteristics of an airborne target. 4,037,228, Cl. 343-18.00C.

Peasley, Howard P. Sewage treatment apparatus. 4,036,754, Cl. 210-139.000.

Peasley, Howard P. Backflush filter system. 4,036,757, Cl. 210-196.000.

Pecaro, George J. Drip irrigation emitter. 4,036,435, Cl. 239-116.000.

Peddle, Charles: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.

Pedersen, Vernon G.: *See—*
Briley, Ronald D.; and Pedersen, Vernon G., 4,035,857, Cl. 9-342.000.

Peel, Aubrey A., Sr. Safety cage for tire inflation. 4,036,274, Cl. 157-1.000.

Peer, Thomas Richard: *See—*
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.

Pehrsson, Anders Lennart, to Aktiebolaget Karlstads Mekaniska Werkstad. Apparatus for mounting and dismounting a submerged propeller unit for a floating body. 4,036,163, Cl. 115-34.00R.

Peirce, Allen E.: *See—*
Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,037,189, Cl. 340-6.00R.

Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, to CKD Praha, oborovy podnik. High-power semiconductive devices. 4,037,246, Cl. 357-82.000.

Pemco Corporation: *See—*
Smith, Henry D., 4,037,265, Cl. 361-58.000.

Pemrick, Raymond E.; and Cocanour, Paul M., to Norton Company. Coated abrasive backing of dimensionally stabilized heat stretched fabric. 4,035,961, Cl. 51-295.000.

Pennington, William. Heat sealing of plastic sheets. 4,036,676, Cl. 156-273.000.

Pennsylvania Engineering Corporation: *See—*
Pearce, Jai K.; and Wells, William, 4,036,481, Cl. 266-222.000.

Pennwalt Corporation: *See—*
Little, Thomas Hamilton, 4,036,426, Cl. 233-7.000.

Pentel Kabushiki Kaisha: *See—*
Abe, Kiyomi; and Tagata, Genichi, 4,035,933, Cl. 35-48.00R.

Penzias, Rolf, to Molins Limited. Rod-like articles. 4,036,118, Cl. 93-77.0FT.

Perani, Giuseppe, to Fonderie F. Ili Perani S.p.A. Radiator for heating plants with elements. 4,036,287, Cl. 165-55.000.

Perkin-Elmer Corporation, The: *See—*
Chamran, Morteza M.; and Nemec, Allen R., 4,037,154, Cl. 324-123.00R.
Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, 4,037,003, Cl. 427-2.000.

Pernegger, Wolfgang: *See—*
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.

Perronnet, Jacques; and Girault, Pierre, to Roussel-UCLAF. Crotonanilides. 4,036,633, Cl. 71-106.000.

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Perry, Carlos V., Sr.; Perry, Carlos V., Jr.; and Perry, Christopher G., 4,036,249, Cl. 137-367.000.

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Perry, Christopher G.: *See—*
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Perry, Eric; Heath, Roy T.; Rost, Lee F.; and Cowan, Braughler, to C & P Industries, Inc. Bottle handling apparatus. 4,036,382, Cl. 214-313.000.

Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, to Calgon Corporation. Methods of using cementing compositions having improved flow properties, containing sulfonated copolymers of styrene-maleic anhydride. 4,036,660, Cl. 106-90.000.

Perticamps S.A.Embalagens: *See—*
Camps, Jean Bernard, 4,036,413, Cl. 222-500.000.

Peterson, Wesley D.: *See—*
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Petit, Jean Francois: *See—*
Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000.

Petito, Ferdinand C.: *See—*
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,037,131, Cl. 313-388.000.

Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davydovich; Suxov, Gennady Ilich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich. Double-piston rock drill. 4,036,309, Cl. 173-103.000.

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Petro-Tex Chemical Corporation: *See—*
Manning, Harold E., 4,036,781, Cl. 252-439.000.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,036,959, Cl. 424-248.560.

Petzoldt, Karl; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of estrene-3,17-dione derivatives. 4,036,695, Cl. 195-51.00B.

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Becker, Dietmar; Jehle, Fritz; Schonthaler, Rubi; and Willenbacher, Erich, 4,036,156, Cl. 112-121.260.

Pfeiler, Manfred: *See—*
Lutz, Herbert; and Pfeiler, Manfred, 4,037,107, Cl. 250-402.000.
Pfizer Inc.: *See—*
Barth, Wayne E., 4,036,846, Cl. 260-306.70C.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832, Cl. 260-240.00R.
Sciavolino, Frank C., 4,036,853, Cl. 260-343.000.
Philip Morris Incorporated: *See—*
Teng, Lina Chen, 4,036,237, Cl. 131-17.00R.
Philip, Thoni V.; and Maniar, Gunvant N., to Carpenter Technology Corporation. Alloy steel. 4,036,640, Cl. 75-126.00C.
Phillips, Edwin R.; and Stankiewicz, Raymond J., to Sperry Rand Corporation. High speed development technique. 4,036,175, Cl. 118-651.000.
Phillips Petroleum Company: *See—*
Cruzan, Charles G., 4,036,062, Cl. 73-422.0GC.
Farfaglia, Silvio T., 4,035,926, Cl. 34-34.000.
Quigg, Donald J., 4,036,699, Cl. 195-142.000.
Roof, Lewis B.; and Porter, Grady T., 4,036,063, Cl. 73-422.0GC.
Strope, Daniel J., 4,036,904, Cl. 260-681.50R.
Phillips, Reginald Andrew, to Dobson Park Industries, Ltd. Pressure fluid operated percussion tools. 4,036,108, Cl. 91-165.000.
Phillips, William, to RCA Corporation. Method of making optical waveguides and product by the process. 4,037,005, Cl. 427-162.000.
Philstone Nail Corporation: *See—*
Bennett, Milton, 4,035,898, Cl. 29-788.000.
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Pickard, John: *See—*
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Pickles, Joseph, to Ferro Manufacturing Corporation. Seat recliner hinge assembly. 4,035,866, Cl. 16-146.000.
Pickton, Shailer T.; and Dean, Gordon B., to Systron Donner Corporation. Exponential decay wave form generator and method. 4,037,164, Cl. 328-187.000.
Piekarski, Gottfried; Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund, to Wacker-Chemie GmbH. Organo-aluminum-silicon reducing agents and process. 4,036,867, Cl. 260-448.00A.
Pieri, Giampiero: *See—*
Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, 4,036,733, Cl. 208-12.000.
Pierre, Kenneth Jonas; Tung, Ker-Kong; and Nadj, Henriette, to Beckman Instruments, Inc. Kinetic assay for alpha-amylase. 4,036,697, Cl. 195-99.000.
Pilkington Brothers Limited: *See—*
Yale, Brian; and Sircar, Anup, 4,036,654, Cl. 106-52.000.
Pinder, Russell Stuart; and Clark, Leslie, to International Research and Development Company Limited. Photodetectors and thin film photovoltaic arrays. 4,036,645, Cl. 136-89.00C.
Pinsonneault, Jacques Emile: *See—*
DeRees, Delbert D.; and Pinsonneault, Jacques Emile, 4,036,522, Cl. 296-154.000.
Pipkin, Denzil B. Hook and leader storage device. 4,036,451, Cl. 242-137.100.
Pirc, Vladimir Valentine: *See—*
Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, 4,037,003, Cl. 427-2.000.
Pircon, Ladislav J. Endless belt impingement apparatus and method. 4,036,609, Cl. 55-91.000.
Pittet, Alan O.: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886, Cl. 260-599.000.
Pittinger, Charles B., Jr. Filament wound perforate plate system. 4,035,915, Cl. 30-347.000.
Plank, Don A., to Exxon Research and Engineering Company. Photodegradable polyolefin composition containing a dinaphthylphthalate. 4,037,034, Cl. 526-5.000.
Plastomedical Sciences, Inc.: *See—*
Steckler, Robert, 4,036,788, Cl. 260-2.10E.
Platter, Fenton H. Mattress construction for use in hospitals and the like. 4,035,853, Cl. 5-91.000.
Plempel, Manfred: *See—*
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,966, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,967, Cl. 424-269.000.
Plunguian, Mark; and Cornwell, Charles E. Shaped articles of hydraulic cement compositions having a reflective surface. 4,036,839, Cl. 264-256.000.
Poiblaud, Gerard Joseph, to U.S. Philips Corporation. Method of preparing galliumphosphide. 4,036,932, Cl. 423-299.000.
Poirier, Robert Victor, to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene copolymer fine powder resin. 4,036,802, Cl. 260-296.00F.
Pokorny, Oldrich: *See—*
Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246, Cl. 357-82.000.
Polaroid Corporation: *See—*
Karger, Eva R.; and MacGregor, Paul T., 4,036,863, Cl. 260-386.000.
Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,036,741, Cl. 208-139.000.
Polyakov, Viktor Ivanovich: *See—*
Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich; Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich, 4,036,425, Cl. 233-2.000.
Polymer Corporation Limited: *See—*
Smith, Brian Howard Alfred, 4,036,911, Cl. 260-880.00R.
Ponci, Riccardo: *See—*
Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, 4,036,963, Cl. 424-258.000.
Pongracz, Magdalena Julia Beatriz: *See—*
Amato, Jose; Propker, Marta; Pongracz, Magdalena Julia Beatriz; and Szabo, Jorge Luis Jose, 4,036,985, Cl. 424-320.000.
Poole, Ralph B., to Sprague Electric Company. Electrolytic capacitor package having a grommet with tapered lead holes. 4,037,142, Cl. 361-433.000.
Porcelli, Joseph J.: *See—*
Wristers, Jos; Siskin, Michael; and Porcelli, Joseph J., 4,036,737, Cl. 208-108.000.
Pornin, Rene: *See—*
Blanc, Jean-Henri; Pornin, Rene; and Voirin, Robert, 4,037,035, Cl. 526-16.000.
Portals Limited: *See—*
Wood, William Albert, 4,037,007, Cl. 428-199.000.
Porter, Grady T.: *See—*
Roof, Lewis B.; and Porter, Grady T., 4,036,063, Cl. 73-422.0GC.
Post Office, The: *See—*
Hensel, Paul Christopher; and Spiers, Ronald Geoffrey, 4,036,419, Cl. 225-96.500.
Potemkin, Jury Pavlovich: *See—*
Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl. 313-188.000.
Potter, William Duncan: *See—*
Howes, John Gordon Bernard; da Costa, Nicholas Mario; Selway, Rupert Alec; and Potter, William Duncan, 4,036,814, Cl. 260-47.0UA.
Potyondy, Isvtvan. 360° Swing. 4,036,489, Cl. 272-49.000.
Pouey, Michel, to Etablissement Public: Agence Nationale de Valorisation de Recherche (ANVAR). Focalization process of spherical concave diffraction gratings. 4,036,558, Cl. 356-79.000.
Powell, Michael W.: *See—*
Hoffman, Charles R.; and Powell, Michael W., 4,037,243, Cl. 357-23.000.
Powers, Charles A.; Holman, George B.; and Smith, Robert C., to Standard Oil Company (Indiana). Process and composition for cementing casing in a well. 4,036,301, Cl. 166-293.000.
PPG Industries, Inc.: *See—*
Carroll, Thomas D.; and Cross, Christopher G., 4,036,622, Cl. 65-3.00R.
Rahn, Henry W., 4,036,727, Cl. 204-268.000.
Ramler, Warren J.; and Lackore, James K., 4,037,112, Cl. 250-527.000.
Sieger, John S.; and Gulotta, Joseph A., 4,036,626, Cl. 65-182.00R.
Pratt, Albert R., to Raytheon Company. Brake lock knob assembly. 4,036,079, Cl. 74-531.000.
Press, Jack J. Atmospheric heat exchange method and apparatus. 4,036,209, Cl. 126-271.000.
Presti, Fredrick Joseph. Seamless retread envelope. 4,036,271, Cl. 150-54.00B.
Preston, Edward G.; Rakowicz, Jan A.; and Labbe, Francis A. M., to Molins Limited. Hopper for a cigarette making machine. 4,036,239, Cl. 131-109.00R.
Price, Henry F.: *See—*
Jamieson, John; Price, Henry F.; and Butts, William O., 4,037,239, Cl. 354-203.000.
Priebe, William F., to Frito-Lay, Inc. Process for concentrating dilute aqueous starch mixtures. 4,036,664, Cl. 127-69.000.
Prince, Douglas F., to Castone Development Corporation. Concrete product manufacturing system. 4,036,575, Cl. 425-443.000.
Prince, Jack M.; and Yang, Dai Chung, to Fibre-Metal Products Co., The. Suspension for a hard hat. 4,035,847, Cl. 2-416.000.
Procter & Gamble Company, The: *See—*
Nishioka, Masato; and Carter, Daniel Dulaney, 4,036,386, Cl. 215-260.000.
Slone, Thomas James, 4,036,407, Cl. 222-188.000.
Prodel, Ulrich, to Spumalit-Anstalt. Plastic bottle case. 4,036,391, Cl. 220-21.000.
Proell, Wayne A.: *See—*
Selin, Clifford E.; Proell, Wayne A.; and Applegate, James M., 4,036,934, Cl. 423-394.000.
Propker, Marta: *See—*
Amato, Jose; Propker, Marta; Pongracz, Magdalena Julia Beatriz; and Szabo, Jorge Luis Jose, 4,036,985, Cl. 424-320.000.
Puech, Claude: *See—*
Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.
Pugsley, Peter C.; and Kellner, Philip R., to Crosfield Electronics Limited. Image reproduction systems. 4,037,075, Cl. 219-121.0LM.
Pugsley, Peter C., to Crosfield Electronics Limited. Reproduction of colored images. 4,037,249, Cl. 358-76.000.
Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, to Nya Asfalt AB. Process for the preparation of an impregnated building material, and the product thereby obtained. 4,036,658, Cl. 106-90.000.
Purser, Kenneth H., to General Ionex Corporation. Ultra-sensitive

spectrometer for making mass and elemental analyses. 4,037,100, Cl. 250-281.000.

Pye, David S.: *See—*
Fischer, Paul W.; and Pye, David S., 4,036,764, Cl. 252-8.50C.

Quaker Oats Company, The: *See—*
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,036,996, Cl. 426-254.000.

Qualitrol Corporation: *See—*
Bodker, John R., 4,036,058, Cl. 73-350.000.

Quantel Limited: *See—*
Stalley, Anthony Donald, 4,037,203, Cl. 364-900.000.

Questor Corporation: *See—*
Bajorek, Jay E.; and Newman, Albert L., 4,035,978, Cl. 52-727.000.

Quigg, Donald J., to Phillips Petroleum Company. Fermentation apparatus and method. 4,036,699, Cl. 195-142.000.

Quitschau, Algird R.: *See—*
Kennedy, Richard T.; Quitschau, Algird R.; and Kettelson, Ernest S., 4,036,396, Cl. 220-242.000.

Quon, Donald S., to Wagner Electric Corporation. Wheel slip control system adapted to use on low coefficient surfaces. 4,036,536, Cl. 303-96.000.

R. E. Phelon Company, Inc.: *See—*
Burson, Bob O., 4,036,201, Cl. 123-148.0CC.

R. L. Kuss & Co., Inc.: *See—*
Combest, John F., 4,036,758, Cl. 210-223.000.

Rabehl, Kenneth R., to Murray, James T., a part interest. Lubrication device for snowmobile sliderail. 4,036,320, Cl. 180-5.00R.

Rabins, Leonard: *See—*
Gregg, Gordon E.; Howell, Thomas H.; and Rabins, Leonard, 4,037,093, Cl. 235-164.000.

Rabko, Vladimir Davydovich: *See—*
Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davydovich; Suxov, Gennady Ilich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000.

Rademachers, Jacob; Erfurth, Henning; and Hund, Franz, to Bayer Aktiengesellschaft. Metal additions to pigments of pseudobrookite-titanium dioxide structure. 4,036,662, Cl. 106-300.000.

Rahn, Henry W., to PPG Industries, Inc. Electrode unit. 4,036,727, Cl. 204-268.000.

Raible, Hermann; and Muller, Rolf, to Mathias Bauerle GmbH. Offset duplicator with master treating means. 4,036,135, Cl. 101-463.000.

Rainbolt, Jack D.: *See—*
Henning, Dale A.; and Rainbolt, Jack D., 4,036,330, Cl. 188-72.800.

Raisson, Gerard D.: *See—*
Morlet, Jean G.; Honnorat, Yves C.; and Raisson, Gerard D., 4,036,568, Cl. 425-8.000.

Rakowicz, Jan A.: *See—*
Preston, Edward G.; Rakowicz, Jan A.; and Labbe, Francis A. M., 4,036,239, Cl. 131-109.00R.

Ramacciotti, Aldo, to Centro Sperimentale Metallurgico S.p.A. Process for the production of large steel ingots. 4,036,278, Cl. 164-52.000.

Ramet, Gilbert, to Ebauches S.A. Vacuum deposition through plural masks on plural substrates. 4,036,171, Cl. 118-49.100.

Ramler, Warren J.; and Lackore, James K., to PPG Industries, Inc. Apparatus for crosslinking ultraviolet light curable coatings. 4,037,112, Cl. 250-527.000.

Rammensee, Horst: *See—*
Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R.

Ramsey, John B., Jr.: *See—*
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,037,131, Cl. 313-388.000.

Ramsey, Maynard, III. Body fluid pressure system. 4,036,216, Cl. 128-2.05D.

Rankin, Armand T., to Stone City Products, Inc. Gutter guard. 4,036,761, Cl. 210-474.000.

Ranz, Erwin: *See—*
Hellmig, Ehrhard; and Ranz, Erwin, 4,036,646, Cl. 96-74.000.

Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, to Clark Equipment Company. Extension and retraction means for the telescopic boom assembly of a crane. 4,036,372, Cl. 212-144.000.

Raphael, Richard Anthony: *See—*
Rutherford, David; Williams, Peter; and Raphael, Richard Anthony, 4,036,983, Cl. 424-295.000.

Rapp, Gertrude A.: *See—*
Rapp, Wallace Thomas; Rapp, Wallace A.; and Rapp, Gertrude A., 4,035,946, Cl. 43-131.000.

Rapp, Wallace A.: *See—*
Rapp, Wallace Thomas; Rapp, Wallace A.; and Rapp, Gertrude A., 4,035,946, Cl. 43-131.000.

Rapp, Wallace Thomas; Rapp, Wallace A.; and Rapp, Gertrude A. Trap for slugs and snails. 4,035,946, Cl. 43-131.000.

Rauch, Hans: *See—*
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Ray, Jean-Louis; and Laugier, Robert, to Rhone-Progil. Cobalt oxide-based catalytic substances for the oxidation of ammonia. 4,036,935, Cl. 423-404.000.

Ray, Ranjan; and Kavesh, Sheldon, to Allied Chemical Corporation. Binary amorphous alloys of iron or cobalt and boron. 4,036,638, Cl. 75-123.00B.

Raychem Corporation: *See—*
Brook, Greville B.; Brooks, Peter L.; and Iles, Roger F., 4,036,669, Cl. 148-11.50C.
Lyons, Bernard J., 4,036,719, Cl. 204-159.140.

Raymond, Joseph H., Jr., to Texas Instruments Incorporated. Multiphase clocking for MOS. 4,037,090, Cl. 235-152.000.

Raymond Lee Organization, Inc., The: *See—*
Cowit, Burt L., 4,037,192, Cl. 340-58.000.
Hoogvelt, Roy; and Hoogvelt, Jack, 4,036,398, Cl. 220-270.000.
Thany, Imre, 4,036,424, Cl. 229-52.00A.
Vierra, Frank C.; and Vierra, Joyce L., 4,036,491, Cl. 272-119.000.

Raytheon Company: *See—*
Pratt, Albert R., 4,036,079, Cl. 74-531.000.
Terzian, John, 4,037,202, Cl. 364-200.000.

Razdan, Raj Kumar; and Dalzell, Haldean Cloyce, to Sharps Associates. Benzopyrans having an unsaturated side chain. 4,036,857, Cl. 260-345.300.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,037,155, Cl. 324-133.000.
Dietz, Wolfgang Friedrich Wilhelm, 4,037,137, Cl. 315-398.000.
Eaton, Sargent Sheffield, Jr., 4,037,140, Cl. 361-56.000.
Gittleman, Jonathan Isaac, 4,037,014, Cl. 428-331.000.
Kisor, Thaddeus William, 4,037,267, Cl. 361-220.000.
Phillips, William, 4,037,005, Cl. 427-162.000.
Stewart, Roger Green; and Seixo de Melo Paulino, Marceano, 4,037,114, Cl. 307-205.000.
Weiner, Joel Alan, 4,036,651, Cl. 106-1.000.
Wojslawowicz, Jack Edward, 4,037,195, Cl. 340-66.000.

Re, Carlo. Liquid applicator. 4,036,172, Cl. 118-262.000.

Readal, Thomas C.; McKinney, Joel D.; and Titmus, Robert A., to Gulf Research & Development Company. Hydrocarbon catalytic cracking process. 4,036,740, Cl. 208-120.000.

Reagents of the University of California: *See—*
Mehta, Povindar K., 4,036,657, Cl. 106-89.000.

Reba, Imants; Hogland, Gerald Hugh; and Wolthausen, Edward Clair, to Crown Zellerbach Corporation. Fiber distribution and depositing apparatus. 4,035,870, Cl. 19-155.000.

Reba, Imants: *See—*
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Reed, James E.: *See—*
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Reed, Richard S. Production of high purity hydrogen fluoride from silicon tetrafluoride. 4,036,938, Cl. 423-483.000.

Reed, Robert D.; Schwartz, Robert E.; and Noble, Roger K., to John Zink Company. Turbine-driven air-powered flare. 4,036,580, Cl. 431-202.000.

Reichel, Pavel: *See—*
Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246, Cl. 357-82.000.

Reimer, Karl-Juergen: *See—*
Hammon, Fritz; Schnell, Georg; and Reimer, Karl-Juergen, 4,037,259, Cl. 360-66.000.

Reinehr, Ulrich: *See—*
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Reist, Walter. Product handling equipment for an imbricated product formation. 4,036,356, Cl. 198-680.000.

Reiter, Robert C., to Material Control, Inc. Conveyor belt cleaner. 4,036,351, Cl. 198-499.000.

Reiter, Robert C., to Material Control, Inc. Conveyor belt cleaner. 4,036,354, Cl. 198-499.000.

Reliance Electric Company: *See—*
Bublitz, Arthur T.; and Holben, Eugene F., 4,036,256, Cl. 137-595.000.

Rembaum, Alan; and Yen, Shiao-Ping Siao, to California Institute of Technology. Conductive hydrogel containing 3-ionene. 4,036,808, Cl. 260-42.510.

Renault, Philippe: *See—*
Huron, Marie-Jose; Jacquin, Yves; and Renault, Philippe, 4,036,943, Cl. 423-576.000.

Rennie, Robert Allan Campbell: *See—*
Crosby, John; Rennie, Robert Allan Campbell; and Paton, Robert Michael, 4,036,869, Cl. 260-453.0AP.

Reppert, Merlyn R., to W. R. Grace & Co. Wheel adaptor device. 4,036,530, Cl. 301-9.0DN.

Resch, Alois Ruppert, to Bunker Ramo Corporation. Device for crimping conductors onto contacts of a contact strip. 4,035,896, Cl. 29-753.000.

Research Corporation: *See—*
Williams, Joel Lawson; and Stannett, Vivian Thomas, 4,036,588, Cl. 8-130.100.

Research Institute for Medicine and Chemistry Inc.: *See—*
Barton, Derek Harold Richard; and Hesse, Robert Henry, 4,036,864, Cl. 260-397.300.

Reusch, Lothar: *See—*
Thumm, Helmut; Reusch, Lothar; and Wahl, Rainer, 4,036,086, Cl. 82-24.00R.

Reuter, Peter: *See—*
Blechschmitt, Kurt; Reuter, Peter; Wirth, Friedrich; Buerger, Gert; and Seubert, Rolf, 4,036,783, Cl. 252-461.000.

Rhodes, Arthur J. Automatic shaping device with a pre-cutting assembly. 4,036,269, Cl. 144-1.00D.

Rhodes, Earl H., Jr., to Stryker Corporation. Surgical saw. 4,036,236, Cl. 128-317.000.

Rhodia, Inc.: *See—*
Sibeud, Jacques Pierre; and Ruff, Charles David, 4,036,942, Cl. 423-573.000.

Rhone-Poulenc Industries: *See—*
Bardonnet, Claude; Brun, Robert; and Pages, Michel, 4,036,760, Cl. 210-323.00R.

Chretien, Gilbert; Ditacroute, Gerard; and Meyer, Jacques, 4,036,908, Cl. 260-863.000.
Leroi, Jean-Claude; and Vachet, Francois, 4,036,703, Cl. 203-57.000.
Rhone-Progil: *See*—
Ray, Jean-Louis; and Laugier, Robert, 4,036,935, Cl. 423-404.000.
Ribaldone, Giuseppe; and Borsotti, Giampiero, to Montedison Fibre S.p.A. Method for the preparation of 2-hydroxybenzanthrone compounds. 4,036,859, Cl. 260-364.000.
Rice, Max. Polytetrafluorethylene coated exercising post kit with repetitive varying diameter. 4,036,490, Cl. 272-67.000.
Rich, Donald S., to Inflo Systems, Inc. Conductive liquid switches. 4,036 827, Cl. 200-209.000.
Richards, Glenn L., to Stromberg-Carlson Corporation. Difference amplifier having extended common mode range. 4,037,170, Cl. 330-69.000.
Richards, John A. Concrete pumping apparatus. 4,036,564, Cl. 417-344.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,036,841, Cl. 260-293.530.
Richter, Gerd: *See*—
Harand, Elmar; Richter, Gerd; and Tschopel, Gunter, 4,036,561, Cl. 415-18.000.
Richter, Helmut: *See*—
Klapdar, Wilhelm; Richter, Helmut; Spetzler, Edgar; and Wendorff, Jochen, 4,036,635, Cl. 75-49.000.
Rickard, Allan Robert; and George, Brian Victor, to Nuclear Power Company Limited. Nuclear reactors. 4,036,687, Cl. 176-37.000.
Ridley, Richard D.: *See*—
Cha, Chang Yul; and Ridley, Richard D., 4,036,299, Cl. 166-261.000.
Riebel, Hans-Jochem: *See*—
Hoffmann, Hellmut; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,036,982, Cl. 424-285.000.
Riegel, Herbert: *See*—
Strangio, Vincent A.; Riegel, Herbert; and Sze, Morgan C., 4,036,897, Cl. 260-648.00C.
Riegel, Herbert D.; Schindler, Harvey D.; and Strangio, Vincent A., to Lummus Company, The. Recovery of chlorine values from a melt oxidation gas. 4,036,776, Cl. 252-187.00R.
Rieter Machine Works, Ltd.: *See*—
Schar, Hugo, 4,036,446, Cl. 242-39.000.
Roach, Kenneth N.: *See*—
Woonton, Kent; Short, Jeffrey R., III; and Roach, Kenneth N., 4,036,277, Cl. 164-16.000.
Robbins, William E.: *See*—
Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., 4,036,987, Cl. 424-325.000.
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., to Kaiser Aluminum & Chemical Corporation. Bayer process production of alumina. 4,036,931, Cl. 423-121.000.
Robert, Jacques: *See*—
Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.0LC.
Roberts, Frank William; Roberts, Richard Allen; Roberts, Waldo Calvin; and Blanpied, Robert Howard. Composite panel-board and method of making same. 4,037,006, Cl. 428-71.000.
Roberts, James Norman. Reinforcing dental pin cutter and retainer. 4,035,917, Cl. 32-40.00R.
Roberts, Richard Allen: *See*—
Roberts, Frank William; Roberts, Richard Allen; Roberts, Waldo Calvin; and Blanpied, Robert Howard, 4,037,006, Cl. 428-71.000.
Roberts, Waldo Calvin: *See*—
Roberts, Frank William; Roberts, Richard Allen; Roberts, Waldo Calvin; and Blanpied, Robert Howard, 4,037,006, Cl. 428-71.000.
Robertshaw Controls Company: *See*—
Brushwyler, Gordon R.; and Scott, Timothy F., 4,036,722, Cl. 204-195.00B.
Lux, Joseph W.; and Varanelli, John M., 4,035,901, Cl. 29-243.500.
Wagner, Joseph P.; and Jackson, Byron L., 4,036,433, Cl. 236-100.000.
Robinson, Daniel T., to Milwaukee Valve Company, Inc. Butterfly valve. 4,036,469, Cl. 251-306.000.
Robinson, James D., to Auto-Chlor System. Means for indicating dishwasher additive absence. 4,036,404, Cl. 222-39.000.
Robinson, Kenneth J. Foldable enclosure. 4,035,964, Cl. 52-66.000.
Robinson, Neil Lloyd: *See*—
Barkley, John Allen; Robinson, Neil Lloyd; and Shelledy, Frank Boyd, 4,037,264, Cl. 360-129.000.
Robinson, Raymond B. E. Bowling lane conditioning method and article produced thereby. 4,036,496, Cl. 273-51.000.
Rock, Frank C., to National Controls, Inc. Computing scale and method with taring capability. 4,036,316, Cl. 177-1.000.
Rockwell International Corporation: *See*—
Anderson, Bruce D., 4,036,329, Cl. 188-72.700.
Cornett, Lee G.; and Peterson, Wesley D., 4,037,178, Cl. 333-71.000.
Rodway, William George: *See*—
Brown, Michael Trevenen; and Rodway, William George, 4,036,718, Cl. 204-159.200.
Roehm, Edward L.: *See*—
Baechle, William G.; and Roehm, Edward L., 4,036,526, Cl. 297-452.000.
Roger, Heinz: *See*—
Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl. 210-168.000.
Rogers, Howard David: *See*—
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.
Rohrig, Adalbert; Willim, Fritz; and Hannah, Brian, to Concast AG. Method of starting the casting of a strand in a continuous casting installation. 4,036,280, Cl. 164-82.000.
Rolodex Corporation: *See*—
Neilsen, Hildaur L., 4,035,938, Cl. 40-68.600.
Ruskin, Henry, 4,036,088, Cl. 83-167.000.
Roloff, Heinz-Rudolf. Entry or passage door, especially for shower stalls. 4,035,957, Cl. 49-388.000.
Romagnolo. Gerard, to Ugine Carbone. Detachable cutting plate for descaling round bars on a centerless machine. 4,035,888, Cl. 29-95.00R.
Romeiser, Bernhard: *See*—
Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, 4,036,865, Cl. 260-428.000.
Ronai, Anne A. Collapsible combination fence and garage structure. 4,035,965, Cl. 52-66.000.
Roof, Lewis B.; and Porter, Grady T., to Phillips Petroleum Company. Sample dilution. 4,036,063, Cl. 73-422.0GC.
Rosback, Donald H.; and Neuzil, Richard W., to UOP Inc. Olefin separation process. 4,036,744, Cl. 208-310.00Z.
Rose, John Brewster: *See*—
Feasey, Ronald George; and Rose, John Brewster, 4,036,815, Cl. 260-49.000.
Roselius, Ronald R.; and Edeleanu, Alexander G., to Chevron Research Company. Process for upgrading motor gasoline. 4,036,735, Cl. 208-89.000.
Rosen, Perry: *See*—
Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,036,871, Cl. 260-468.00D.
Rosenfeld, Arthur. Candle with integral card holder. 4,035,937, Cl. 40-16.400.
Rosenfeld, Howard, to Burlington Industries, Inc. Linen sorter with a conveyor mounting individual linen pickers. 4,036,365, Cl. 209-73.000.
Rosenkranz, Hans Jurgen: *See*—
Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, 4,036,748, Cl. 210-23.00H.
Ross, Adma Schneller: *See*—
Curran, William Vincent; Tomcufcik, Andrew Stephen; and Ross, Adma Schneller, 4,036,849, Cl. 260-308.00D.
Ross, Charles E.: *See*—
Dixon, Cal L.; and Ross, Charles E., 4,036,366, Cl. 211-4.000.
Ross, William Alden: *See*—
Ashmead, Albert Sidney; Ross, William Alden; and Shepard, Richard Wilton, 4,036,036, Cl. 66-123.000.
Rossi, Irving. Method for continuously casting a slab. 4,036,281, Cl. 164-89.000.
Rost, Lee F.: *See*—
Perry, Eric; Heath, Roy T.; Rost, Lee F.; and Cowan, Braughler, 4,036,382, Cl. 214-313.000.
Rothmayer, Jules, to Sun Chemical Corporation. Encapsulated pigments. 4,036,652, Cl. 106-308.00N.
Roto-Finish Company: *See*—
Bälz, Gunther W., 4,035,960, Cl. 51-163.100.
Roussel-UCLAF: *See*—
Perronnet, Jacques; and Girault, Pierre, 4,036,633, Cl. 71-106.000.
Rowe, Marvin Herbert, to Du Pont de Nemours, E. I., and Company. Process for oxidizing sulfur dyes. 4,036,586, Cl. 8-37.000.
Rowen, William I.: *See*—
Kowach, Ronald A.; and Rowen, William I., 4,036,164, Cl. 115-37.000.
Roy, Alexander Rose; and Clarke, Anthony Bayliss. Diamond synthesis. 4,036,937, Cl. 423-446.000.
Roy, Waldemar: *See*—
Laufer, Siegmar; and Roy, Waldemar, 4,036,933, Cl. 423-338.000.
Rozehnal, Gunther; and Wedler, Hartmut, to Siemens Aktiengesellschaft. Apparatus for sensing, transmitting and displaying signal states. 4,037,199, Cl. 340-150.000.
Ruble, Frank D.: *See*—
Osterlund, Alfred G.; and Ruble, Frank D., 4,037,208, Cl. 364-900.000.
Rudolph, Hans: *See*—
Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, 4,036,748, Cl. 210-23.00H.
Ruff, Charles David: *See*—
Sibeud, Jacques Pierre; and Ruff, Charles David, 4,036,942, Cl. 423-573.000.
Ruff, George Robert; and Derrick, Danny O'Brian, to Shakespeare Company. Rung assembly for a ladder and a method of making the rung assembly. 4,036,325, Cl. 182-46.000.
Ruff, John, to General Foods Limited. Honey containing dessert composition. 4,036,998, Cl. 426-302.000.
Rupinski, Fredrick Alexander: *See*—
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.

Rusco Industries, Inc.: *See*—
McPhee, John, 4,036,343, Cl. 192-134.000.

Ruskin, Henry, to Rolodex Corporation. Paper punch with variable spacing. 4,036,088, Cl. 83-167.000.

Rusterholz, Otto. Valve for a pulse-wave pneumatic conveyance installation. 4,036,531, Cl. 302-26.000.

Rutherford, David; Williams, Peter; and Raphael, Richard Anthony, to Fisons Limited. Ferrocene compounds and pharmaceutical composition for use in treatment of iron deficiency in an animal. 4,036,983, Cl. 424-295.000.

Ruthner, Othmar. Installation for rearing plants. 4,035,949, Cl. 47-17.000.

Rutkiewicz, Joseph A.: *See*—
Galonska, David A.; McCarthy, James B.; and Rutkiewicz, Joseph A., 4,036,110, Cl. 91-375.00A.

Ryden, Joseph, Jr., to Exxon Research and Engineering Company. Diameter measuring system for cylindrical objects. 4,037,103, Cl. 250-341.000.

Sabatino, Anthony, to Gould Inc. Storage battery and method of forming the same. 4,037,030, Cl. 429-139.000.

Sacchetti, Alfred D. Automatic thread changer. 4,036,157, Cl. 112-163.000.

Saidla, Glen E. W., to Exxon Research and Engineering Company. Method for forming large reinforced foamed plastic panels. 4,036,923, Cl. 264-45.300.

St. Regis-Aci Pty. Limited: *See*—
Hatch, Ronald Frank, 4,036,115, Cl. 93-8.00R.

Saito, Hiroshi: *See*—
Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl. 58-85.500.

Saito, Junichi: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,036,986, Cl. 424-322.000.

Saito, Masumi; Tani, Sumio; Matsui, Shigeaki; and Kasaoka, Shigeaki, to Kurashiki Boseki Kabushiki Kaisha. Catalyst for reduction of nitrogen oxides in presence of ammonia. 4,036,785, Cl. 252-472.000.

Saito, Yoshihisa: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.

Sakai, Takeyo: *See*—
Matsuda, Kazuo; Ohmura, Hidemasa; and Sakai, Takeyo, 4,036,801, Cl. 260-29.2TN.

Saklikar, Arvind R.; and Van Eck, Jack M., to Sherwin-Williams Company, The. Apparatus for the application of colorant to polymeric surface. 4,036,174, Cl. 118-623.000.

Sakurada, Nobuaki: *See*—
Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233, Cl. 354-23.00D.

Sakurai, Susumu: *See*—
Ogoshi, Toshiaki; Miyawaki, Yozo; Kondo, Fusao; and Sakurai, Susumu, 4,036,596, Cl. 23-283.000.

Salmon, Brian: *See*—
Davies, Peter Gough; Jones, Keith Thomas; and Salmon, Brian, 4,036,046, Cl. 72-286.000.

Saltarelli, Martin O., to Beloit Corporation. Refiner head assembly and refining disk therefor. 4,036,443, Cl. 241-297.000.

Sami, Hiroshi; Taira, Kaoru; and Kumai, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor equipped with a cooling system. 4,036,188, Cl. 123-41.310.

Sampson, Mark J. Horological instrument. 4,036,009, Cl. 58-127.00R.

Samuel Moore and Company: *See*—
Houk, Richard D., 4,036,066, Cl. 74-55.000.

Sanaka, Isao: *See*—
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.

Sandell, Richard P.: *See*—
Morgan, Barry S.; and Sandell, Richard P., 4,036,918, Cl. 261-114.00R.

Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Slack adjuster built into a brake unit for a rail vehicle brake system. 4,036,332, Cl. 188-196.00D.

Sander, Nils Borje Lennart: *See*—
Dahlkvist, Nils Goran; Axelsson, Lars Bengt; and Sander, Nils Borje Lennart, 4,036,111, Cl. 92-29.000.

Sandoz, Inc.: *See*—
Houlihan, William J., 4,036,855, Cl. 260-343.30R.
Houlihan, William J., 4,036,978, Cl. 424-274.000.
Neumann, Peter, 4,036,976, Cl. 424-273.000.

Sandoz Ltd.: *See*—
Avar, Lajos; and Hofer, Kurt, 4,036,812, Cl. 260-45.75N.
Mercer, Alec Victor; and Oakland, John Stephen, 4,036,851, Cl. 260-310.00D.
Schaub, Fritz; and Schelling, Hanspeter, 4,036,980, Cl. 424-278.000.

Sandstede, Gerd: *See*—
Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.

Sandvik Aktiebolag: *See*—
Eriksson, Stig-Lennart; and Gustafsson, Manfred Wallace, 4,035,890, Cl. 29-96.000.

Sankyo Company Limited: *See*—
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,036,631, Cl. 71-92.000.

Santi, Luciano, to Officine Galileo Meccanotessile S.p.A. Device to detect the belt tension of weft inserting members in shuttleless looms. 4,036,267, Cl. 139-336.000.

Sapozhnikov, Ivan Vasilievich: *See*—
Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl. 313-188.000.

Sasaki, Toshimi: *See*—
Koike, Keiichi; and Sasaki, Toshimi, 4,037,015, Cl. 428-331.000.

Sasmor, Ernest J.: *See*—
Halpern, Alfred; and Sasmor, Ernest J., 4,036,951, Cl. 424-60.000.

Sato, Goro, to Hokuetsu Kogyo Co., Ltd. Globoid worm type rotary machine. 4,036,567, Cl. 418-105.000.

Sato, Takahisa: *See*—
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,036,780, Cl. 252-437.000.

Sato, Teruo; and Nakamura, Hideo, to Sony Corporation. Stereophonic demodulator apparatus. 4,037,055, Cl. 179-15.0BT.

Satoh, Shinobu. Apparatus for purification of exhaust gases. 4,036,593, Cl. 23-260.000.

Saunders, Leonard R.; and Allard, G. D. Skip. Drill string system. 4,036,539, Cl. 308-4.00A.

Saunders, William T., to National Steel Corporation. Single-slide press for carrying out multiple functions with a single work-input stroke. 4,036,056, Cl. 72-329.000.

Saupe, Martin, to Kaltenbach & Voigt. Dental teaching device. 4,035,920, Cl. 32-71.000.

Savarese, Giuseppe, to Texas Instruments Incorporated. Read-only memory using complementary conductivity type insulated gate field effect transistors. 4,037,217, Cl. 340-173.0SP.

Savariste, Anthony: *See*—
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.

Savinainen, Kyosti: *See*—
Makila, Eino; Virtanen, Unto; and Savinainen, Kyosti, 4,036,440, Cl. 241-20.000.

SBE Incorporated: *See*—
Hodama, Takuo, 4,037,116, Cl. 307-247.00A.

Schaaf, Thomas K.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832, Cl. 260-240.00R.

Schaar, Lothar, to Heye, Hermann. Shearing device for strands of plastic material. 4,036,094, Cl. 83-623.000.

Schaffhauser, Hans: *See*—
Miloradovic, Predrag; and Schaffhauser, Hans, 4,037,160, Cl. 325-42.000.

Schairer, George S., to Boeing Company, The. Retractable engine noise suppression system for over-the-wing jet aircraft. 4,036,452, Cl. 244-1.00N.

Schar, Hugo, to Rieter Machine Works, Ltd. Method and apparatus for braking a bobbin chuck and for releasing a bobbin tube thereon. 4,036,446, Cl. 242-39.000.

Scharbert, Juergen: *See*—
Groeger, Ingo; and Scharbert, Juergen, 4,037,218, Cl. 340-173.00R.

Schat, Hermannus, to ITT Industries, Inc. Charge transfer delay circuit for analog signals. 4,037,119, Cl. 307-293.000.

Schatz, Klaus W.; and Snyder, Paul W., Jr., to Mobil Oil Corporation. Method of regenerating catalyst in a swirl type regenerator containing a dilute phase baffle. 4,036,779, Cl. 252-417.000.

Schaub, Fritz; and Schelling, Hanspeter, to Sandoz Ltd. Ether substituted benzodioxan derivatives. 4,036,980, Cl. 424-278.000.

Scheeter, John J.: *See*—
Waddell, Jerry D.; and Scheeter, John J., 4,036,532, Cl. 302-53.000.

Scheib, Rudi. Tiltable sled. 4,036,506, Cl. 280-21.00A.

Scheidweiler, Andreas; and Meier, Otto, to Cerberus AG. Ionization-type fire or smoke sensing system. 4,037,106, Cl. 250-381.000.

Schelling, Hanspeter: *See*—
Schaub, Fritz; and Schelling, Hanspeter, 4,036,980, Cl. 424-278.000.

Schenk, Norbert: *See*—
Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.

Schering Aktiengesellschaft: *See*—
Petzoldt, Karl; and Wiechert, Rudolf, 4,036,695, Cl. 195-51.00B.

Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Method for providing electrical isolation between spaced portions of a layer of semiconductive material and the product produced thereby. 4,036,706, Cl. 204-15.000.

Schewe, Richard A.: *See*—
Darsie, Burns; and Schewe, Richard A., 4,036,262, Cl. 139-11.000.

Schiffer, Josef: *See*—
Blume, Friedrich, deceased; Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.

Schilken, Herbert: *See*—
Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, 4,036,865, Cl. 260-428.000.

Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang; and Messerschmidt, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Jig. 4,036,485, Cl. 269-285.000.

Schindler, Harvey D.: *See*—
Riegel, Herbert D.; Schindler, Harvey D.; and Strangio, Vincent A., 4,036,776, Cl. 252-187.00R.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Apparatus for producing texturized yarns. 4,035,879, Cl. 28-246.000.

Schirmer, Marvin D. Apparatus for removing and replacing spiral springs in clock barrels. 4,036,084, Cl. 81-7.500.

Schissler, Lloyd R.: *See—*
Edelberg, Murray; and Schissler, Lloyd R., 4,037,205, Cl. 364-900.000.

Schlaikjer, Carl R.: *See—*
Dey, Arabinda N.; and Schlaikjer, Carl R., 4,037,025, Cl. 429-29.000.

Schmall, Karl-Heinz. Vehicle control apparatus. 4,036,323, Cl. 180-105.00R.

Schmauderer, Emil, Jr.: *See—*
Anderson, Roger E.; and Schmauderer, Emil, Jr., 4,036,434, Cl. 239-8.000.

Schmedemann, Helmuth: *See—*
Volkner, Wolfgang; and Schmedemann, Helmuth, 4,036,457, Cl. 244-134.00D.

Schmerling, Louis, to Universal Oil Products Company. Production of chloro-substituted saturated compounds. 4,036,896, Cl. 260-648.00R.

Schmidt, Frederick C.: *See—*
Linn, Donald F.; Schmidt, Frederick C.; and Yanko, John P., 4,036,338, Cl. 192-13.00R.

Schmidt, Robert J., deceased; and Graf, Peter E., to Chevron Research Company. Asphalt mineral aggregate compositions containing silanes as adhesion promoters. 4,036,661, Cl. 106-273.00N.

Schmitt, Arnold J.; and Linkletter, Merle G., to Beloit Corporation. High bulk tissue forming and drying apparatus. 4,036,684, Cl. 162-290.000.

Schneemann, Anthony K. Collet locking and operating mechanism therefor. 4,036,484, Cl. 269-57.000.

Schneider, Fritz: *See—*
Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R.

Schnell, Georg: *See—*
Hammon, Fritz; Schnell, Georg; and Reimer, Karl-Juergen, 4,037,259, Cl. 360-66.000.

Schnell, Hans Gunther, to Van Kooten B.V. Lining for a pile driving head and method and tool for the removal of said lining. 4,036,310, Cl. 173-131.000.

Schober, Hans: *See—*
Madl, Josef; and Schober, Hans, 4,035,913, Cl. 30-287.000.

Scholl, Edward C.: *See—*
Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., 4,036,673, Cl. 156-71.000.

Scholz, Manfred: *See—*
Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, 4,036,700, Cl. 176-87.000.

Schonthaler, Rubi: *See—*
Becker, Dietmar; Jehle, Fritz; Schonthaler, Rubi; and Willenbacher, Erich, 4,036,156, Cl. 112-121.260.

Schrape, Peter: *See—*
Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, 4,036,341, Cl. 192-106.200.

Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, to International Flavors & Fragrances Inc. Processes for producing 4- and 5-phenyl pentenals. 4,036,886, Cl. 260-599.000.

Schreiber, Winfried, to Daimler-Benz Aktiengesellschaft. Belt roll-up mechanism for a safety belt in a vehicle. 4,036,449, Cl. 242-107.000.

Schroder, Klaus Dieter, to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie. Lockable caster, more particularly swivel caster. 4,035,864, Cl. 16-35.00R.

Schruff, Herbert. Fastening element. 4,036,098, Cl. 85-70.000.

Schubert, Bernhard; and Blidung, Otto, to Hauni-Werke Korber & Co., KG. Method and machine for the production of composite filter mouthpieces. 4,036,119, Cl. 93-77.0FT.

Schuster, Wilhelm. Machine for erecting, filling and closing flat-foldable cartons. 4,035,989, Cl. 53-186.000.

Schwalenstocker, Henry John, Jr., to Du Pont de Nemours, E. I., and Company. Silver halide emulsion sensitized with a fused diazepine. 4,036,649, Cl. 96-107.000.

Schwartz, Bradford Clyde; Silkensen, Ralph Donald; and Steving, Gerald, to International Business Machines Corporation. RF bias sputtering method for producing insulating films free of surface irregularities. 4,036,723, Cl. 204-192.0EC.

Schwartz, Newton: *See—*
Feit, Eugene David; and Schwartz, Newton, 4,036,708, Cl. 204-38.00A.

Schwartz, Robert E.: *See—*
Reed, Robert D.; Schwartz, Robert E.; and Noble, Roger K., 4,036,580, Cl. 431-202.000.

Schwarz, Gunter. Ski brake apparatus. 4,036,509, Cl. 280-605.000.

Schwerdtel, Wulf: *See—*
Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.

Sciara, Frank: *See—*
Zurit, David; and Sciara, Frank, 4,035,893, Cl. 29-157.00R.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives-C_3 modifications. 4,036,853, Cl. 260-343.000.

SCM Corporation: *See—*
McGinniss, Vincent Daniel. 4,037,018, Cl. 428-418.000.

Scott Bonnar Limited: *See—*
Knight, Roy George. 4,036,070, Cl. 74-242.700.

Scott, Bruce Albert: *See—*
Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,036,648, Cl. 96-90.00R.

Scott, Joseph D. Trigger release device for bow strings. 4,036,204, Cl. 124-35.00A.

Scott, Timothy F.: *See—*
Brushwyler, Gordon R.; and Scott, Timothy F., 4,036,722, Cl. 204-195.00B.

Seaman, William M., Jr.: *See—*
McKnight, Oliver R.; and Seaman, William M., Jr., 4,036,071, Cl. 74-243.00R.

Searle, John L., to Fischer & Porter Co. Electromagnetic flowmeter usable in less-than-full fluid lines. 4,036,052, Cl. 73-194.0EM.

Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, The: *See—*
Nixon, Ralph Alan, 4,036,161, Cl. 114-296.000.

Seeger, Walter: *See—*
Effenberger, Hubert; and Seeger, Walter, 4,036,006, Cl. 58-23.00R.

Segall, Gordon Hart: *See—*
Holton, Harry Hutchinson; and Segall, Gordon Hart, 4,036,680, Cl. 162-65.000.

Segsworth, Robert Sidney, to Tibur Metals, Ltd. Extended arc furnace and process for melting particulate charge therein. 4,037,043, Cl. 13-9.00R.

Seiler, Hanspeter: *See—*
Seiler, Niklaus; and Seiler, Hanspeter, 4,036,124, Cl. 100-98.00R.

Seiler, Niklaus; and Seiler, Hanspeter. Sludge press. 4,036,124, Cl. 100-98.00R.

Seireg, Ali A.; and Baz, Amr M. S., to Wisconsin Alumni Research Foundation. Decompression plan calculator. 4,037,084, Cl. 235-69.000.

Seixo de Melo Paulino, Marceano: *See—*
Stewart, Roger Green; and Seixo de Melo Paulino, Marceano, 4,037,114, Cl. 307-205.000.

Sekino, Jun: *See—*
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,036,954, Cl. 424-176.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi, 4,036,930, Cl. 264-167.000.
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Electrodeposition of aqueous dispersions of amine functional urethane copolymers. 4,036,800, Cl. 260-29.2TN.

Select Energy Systems, Inc.: *See—*
Fichtner, Robert L., 4,037,141, Cl. 361-182.000.

Selin, Clifford E.; Proell, Wayne A.; and Applegate, James M., to American Hydrocarbon Company. Preparation of nitric acid. 4,036,934, Cl. 423-394.000.

Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. 2 Alkoxyoxamoyl-pyrazines. 4,036,837, Cl. 260-250.0BN.

Selway, Rupert Alec: *See—*
Howes, John Gordon Bernard; da Costa, Nicholas Mario; Selway, Rupert Alec; and Potter, William Duncan, 4,036,814, Cl. 260-47.0UA.

Sennik, John Joseph, to Electrohome Limited. Compensation of cathode ray tube for moire. 4,037,133, Cl. 315-31.0TV.

Senstek Ltd.: *See—*
Strelioff, William P.; Elliott, William S.; and Johnson, Dale, 4,036,065, Cl. 73-432.00R.

Serafin, Francis A.: *See—*
Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., 4,037,172, Cl. 331-94.50E.

Sergeev, Vladimir Alexandrovich: *See—*
Korshak, Vasily Vladimirovich; Sergeev, Vladimir Alexandrovich; and Teplyakov, Mikhail Mikhailovich, 4,036,818, Cl. 260-63.00K.

Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., to Aerospan Corporation. Streamlining apparatus for articulated road vehicle. 4,036,519, Cl. 296-1.00S.

Service Equipment Design Co., Inc.: *See—*
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,036,261, Cl. 138-96.00T.

Sessoms, J. C., Jr.: *See—*
Jordan, Bertram L.; Mitchell, John D.; and Sessoms, J. C., Jr., 4,036,454, Cl. 294-5.500.

Seubert, Rolf: *See—*
Blechschmitt, Kurt; Reuter, Peter; Wirth, Friedrich; Buerger, Gert; and Seubert, Rolf, 4,036,783, Cl. 252-461.000.

Scufert, Wilhelm, to Werner & Pfleiderer. Screw extruder housing. 4,036,540, Cl. 308-239.000.

Severinsen, John, to Metex Corporation. Conductive elastomeric elements. 4,037,009, Cl. 428-241.000.

Seyffert, Michael: *See—*
Allen, Robert M.; and Seyffert, Michael, 4,036,725, Cl. 204-206.000.

Shaffer, Francis N.; and Mathers, James E., to GTE Sylvania Incorporated. Yttrium indium phosphate X-ray phosphors, method of preparation and X-ray intensifying screen containing same. 4,037,110, Cl. 250-483.000.

Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,036,800, Cl. 260-29.2TN.

Shakespeare Company: *See—*
Ruff, George Robert; and Derrick, Danny O'Brian, 4,036,325, Cl. 182-46.000.

Shanklin Corporation: *See*—
Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., 4,035,983, Cl. 53-28.000.
Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., to Shanklin Corporation. Smooth product transfer highspeed L-sealer. 4,035,983, Cl. 53-28.000.
Sharland, David Cedric, to Beecham Group Limited. Pharmaceutical tablet. 4,036,968, Cl. 424-271.000.
Sharp Kabushiki Kaisha: *See*—
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 4,037,230, Cl. 346-75.000.
Shin, Yasuo, 4,036,151, Cl. 108-20.000.
Sharp, Richard Stanton, to Burroughs Corporation. Computer-peripheral interface. 4,037,210, Cl. 364-900.000.
Sharps Associates: *See*—
Razdan, Raj Kumar; and Dalzell, Haldean Cloyce, 4,036,857, Cl. 260-345.300.
Shaw, Richard A.: *See*—
Boyden, Willis G.; and Shaw, Richard A., 4,037,194, Cl. 340-63.000.
Sheetz, Charles E.: *See*—
McClintic, Wayne L.; and Sheetz, Charles E., 4,036,375, Cl. 214-6.00F.
Sheftel, Edward A. Musical instrument supporting apparatus. 4,036,462, Cl. 248-166.000.
Sheldon, John D.: *See*—
Maier, Daniel F.; and Sheldon, John D., 4,036,162, Cl. 115-17.000.
Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., to Shell Oil Company. Preparation of 3-bromobenzaldehyde. 4,036,887, Cl. 260-599.000.
Shell Oil Company: *See*—
Anderson, William S., 4,036,910, Cl. 260-879.000.
Blytas, George C., 4,036,944, Cl. 423-648.00R.
Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., 4,036,887, Cl. 260-599.000.
Shelledy, Frank Boyd: *See*—
Barkley, John Allen; Robinson, Neil Lloyd; and Shelledy, Frank Boyd, 4,037,264, Cl. 360-129.000.
Shelley, Edwin F. Light emitting diode watch with acceleration responsive switch. 4,036,007, Cl. 58-50.00R.
Shepard, Richard Wilton: *See*—
Ashmead, Albert Sidney; Ross, William Alden; and Shepard, Richard Wilton, 4,036,036, Cl. 66-123.000.
Sherritt Gordon Mines Limited: *See*—
Yurko, William J., 4,036,639, Cl. 75-101.0BE.
Sherwin, Donald D. Arrow broadhead. 4,036,499, Cl. 273-106.50B.
Sherwin-Williams Company, The: *See*—
Saklikar, Arvind R.; and Van Eck, Jack M., 4,036,174, Cl. 118-623.000.
Sherwood Medical Industries Inc.: *See*—
Dodge, Larry H.; and Economidy, Byron G., 4,036,231, Cl. 128-276.000.
Shibuta, Osamu: *See*—
Yamaguchi, Hideo; Kume, Hidetoshi; and Shibuta, Osamu, 4,036,936, Cl. 423-407.000.
Shibuya, Masakuni: *See*—
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.
Shidara, Tokihiko: *See*—
Kawai, Shinichi; Maeyama, Shigeo; and Shidara, Tokihiko, 4,037,127, Cl. 313-60.000.
Shields, Michael A.: *See*—
Allen, Richard J.; and Shields, Michael A., 4,035,907, Cl. 29-590.000.
Shikama, Takashi: *See*—
Tamada, Minoru; Shikama, Takashi; and Nakamura, Toshikazu, 4,037,082, Cl. 219-541.000.
Shikano, Yoshiro: *See*—
Kobayashi, Gai; and Shikano, Yoshiro, 4,036,291, Cl. 165-105.000.
Shim, Kyung S., to Stauffer Chemical Company. Polyurethane foams prepared from mixed polyalkylene glycol polyphosphorous compounds. 4,036,789, Cl. 260-2.5AR.
Shimizu, Hidemi: *See*—
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,036,954, Cl. 424-176.000.
Shin, Masami; and Tamaki, Kanji. Tape recorder with head positioning mechanism. 4,037,261, Cl. 360-78.000.
Shin, Yasuo, to Sharp Kabushiki Kaisha. Microwave cooking apparatus with turntable. 4,036,151, Cl. 108-20.000.
Shindo, Tadashi: *See*—
Aisaka, Noboru; Shindo, Tadashi; and Kawakami, Tatsuya, 4,036,034, Cl. 66-50.00R.
Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, to Canon Kabushiki Kaisha. Exposure control device for a camera. 4,037,233, Cl. 354-23.00D.
Shioyama, Giichi: *See*—
Hata, Yoshitaka; Shioyama, Giichi; and Minami, Hidehiro, 4,036,015, Cl. 60-282.000.
Shirogami, Tamotsu: *See*—
Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.
Shishoo, Roshan Lal; and Alfredsson, Sara Inga-Lill, to Svenska Textilforskningsinstitutet. Process and device for molding textile materials. 4,036,924, Cl. 264-89.000.
Shoda, Hiroshi: *See*—
Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904, Cl. 29-563.000.
Short, Jeffrey R., III: *See*—
Woonton, Kent; Short, Jeffrey R., III; and Roach, Kenneth N., 4,036,277, Cl. 164-16.000.
Shults, Vyacheslav Mikhailovich: *See*—
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F.
Shuster, Edward Joseph: *See*—
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886, Cl. 260-599.000.
SI Handling Systems, Inc.: *See*—
Jones, Vercoe C.; and Hale, Robert A., 4,036,148, Cl. 104-166.000.
Sibeud, Jacques Pierre; and Ruff, Charles David, to Rhodia, Inc. Process for the removal of hydrogen sulfide and mercaptans from liquid and gaseous streams. 4,036,942, Cl. 423-573.000.
Sieborger, Gunter; Kilian, Ernst August; and Jonkuhn, Gerhard, to U.S. Philips Corporation. Circuit arrangement for electronically applying an alternating voltage. 4,037,118, Cl. 307-255.000.
Siegel, Israel. Low pressure engine. 4,036,017, Cl. 60-497.000.
Siegel, Israel. Solar differential temperature motor. 4,036,019, Cl. 60-531.000.
Sieger, John S.; and Gulotta, Joseph A., to PPG Industries, Inc. Metallic seal for preventing tin leaks in a float glass furnace. 4,036,626, Cl. 65-182.00R.
Siemens Aktiengesellschaft: *See*—
Betzmeir, Helmut; and Lettau, Hans, 4,036,685, Cl. 176-19.0LD.
Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, 4,036,700, Cl. 176-87.000.
Groeger, Ingo; and Scharbert, Juergen, 4,037,218, Cl. 340-173.00R.
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.
Horninger, Karlheinrich, 4,037,089, Cl. 235-152.000.
Januschkowetz, Herbert; and Laub, Hans, 4,036,707, Cl. 204-20.000.
Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, 4,037,124, Cl. 310-52.000.
Lutz, Herbert; and Pfeiler, Manfred, 4,037,107, Cl. 250-402.000.
Moeckel, Peter, 4,037,263, Cl. 360-114.000.
Neufang, Karlheinz, 4,037,054, Cl. 179-15.0BF.
Rozehnal, Gunther; and Wedler, Hartmut, 4,037,199, Cl. 340-150.000.
Sieradzki, Benjamin; and Giese, John David, to Chemetron Corporation. Mixer. 4,036,477, Cl. 259-41.000.
Sietmann, Vernon H.; Smith, Raymond L.; and Keese, Larry S. Apparatus for drying grain. 4,035,928, Cl. 34-174.000.
Signetics Corporation: *See*—
Allen, Richard J.; and Shields, Michael A., 4,035,907, Cl. 29-590.000.
Silagy, Richard J.: *See*—
Karcher, Thomas D.; and Silagy, Richard J., 4,036,515, Cl. 285-315.000.
Silkensen, Ralph Donald: *See*—
Schwartz, Bradford Clyde; Silkensen, Ralph Donald; and Steving, Gerald, 4,036,723, Cl. 204-192.0EC.
Siltec Corporation: *See*—
Lorenzini, Robert E.; Iwata, Akiyoshi; and Lorenz, Karl, 4,036,595, Cl. 23-273.0SP.
Simes, James G.: *See*—
Hillsman, Deane; Cook, Albert M.; and Simes, James G., 4,036,221, Cl. 128-145.600.
Simjian, Luther G. Exercise and massaging apparatus. 4,036,219, Cl. 128-48.000.
Simon, David L. Fuel. 4,036,604, Cl. 44-53.000.
Simon, Eli. Process for producing improved, protective conversion coatings on aluminum and its alloys, wherein aluminum is the principal constituent. 4,036,667, Cl. 148-6.200.
Singer Company, The: *See*—
Broyles, Douglas Wright; and Stark, Troy Cecil, 4,037,231, Cl. 346-108.000.
Evans, John Lorenz; and Zoltan, Bart Joseph, 4,036,453, Cl. 244-3.160.
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.
Singleton, O'Neal. Device for installing ceiling insulation. 4,036,475, Cl. 254-133.00R.
Sinha, Ram Narain: *See*—
Chopra, Gopal Mohan; Gangadharan, Tyagaraja; and Sinha, Ram Narain, 4,036,138, Cl. 102-24.00R.
Sircar, Anup: *See*—
Yale, Brian; and Sircar, Anup, 4,036,654, Cl. 106-52.000.
Sirico, James Louis: *See*—
Nielsen, Thomas Christian; and Sirico, James Louis, 4,036,381, Cl. 214-310.000.
Siskin, Michael: *See*—
Wristers, Jos; Siskin, Michael; and Porcelli, Joseph J., 4,036,737, Cl. 208-108.000.
Sivers, Curt: *See*—
Jordan, Helmut; and Sivers, Curt, 4,037,108, Cl. 250-427.000.
Sjostrand, Fritiof Stig; Lundmark, Anders Gunnar Rudolf; and Ekstrom, Gosta Ivar, to Atlas Copco Aktiebolag. Handle structure for percussive tools. 4,036,085, Cl. 81-52.300.

Skinner, Everett B.; and Lair, James O., to Talley Industries of Arizona, Inc. Rocket catapult with direct mechanically actuated ignition of rocket motor. 4,036,456, Cl. 244-122.0AD.

Skinner, Wallace: *See*—
Holmes, Charles Chamberlain; Skinner, Wallace; and Mattocks, George Roland, 4,036,625, Cl. 65-134.000.

Skipka, Guido: *See*—
Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R.

Slivensky, Robert B.: *See*—
Floyd, James R.; Dalenberg, Paul N.; and Slivensky, Robert B., 4,036,505, Cl. 277-96.200.

Sloan, Kenneth B.: *See*—
Bodor, Nicolae S.; and Sloan, Kenneth B., 4,036,845, Cl. 260-295.00L.

Slobodskoi, Igor Pavlovich: *See*—
Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl. 313-188.000.

Slobodyanik, Ivan Petrovich. Contact plate for columns for carrying out mass transfer processes between gas and liquid. 4,036,917, Cl. 261-114.0JP.

Slone, Thomas James, to Procter & Gamble Company, The. Dosing valve. 4,036,407, Cl. 222-188.000.

Smith, Barry L., to UMC Industries, Inc. Coin totalizer for different denominations. 4,036,347, Cl. 194-48.000.

Smith, Brian Howard Alfred, to Polymer Corporation Limited. Preparation of graft copolymers. 4,036,911, Cl. 260-880.00R.

Smith, Clyde M.: *See*—
Brown, William E.; and Smith, Clyde M., 4,036,613, Cl. 55-294.000.

Smith, Daniel J.: *See*—
Bertozzi, Eugene R.; Barclay, Robert, Jr.; Packer, David H.; and Smith, Daniel J., 4,036,882, Cl. 260-584.00B.

Smith, Harry: *See*—
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,036,964, Cl. 424-258.000.

Smith, Henry D., to Pemco Corporation. Arc preventing power supply system. 4,037,265, Cl. 361-58.000.

Smith International, Inc.: *See*—
Dixon, Robert L.; and Maxsted, Malcolm D., 4,036,313, Cl. 175-344.000.
Dixon, Robert L.; and Allison, Robert E., 4,036,314, Cl. 175-364.000.

Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., to Sunbeam Equipment Corporation. Liquid quenching system. 4,036,478, Cl. 266-133.000.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,036,971, Cl. 424-273.000.

Smith, Raymond L.: *See*—
Sietmann, Vernon H.; Smith, Raymond L.; and Keese, Larry S., 4,035,928, Cl. 34-174.000.

Smith, Richard Stanley: *See*—
Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, 4,036,415, Cl. 223-40.000.

Smith, Robert C.: *See*—
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,036,301, Cl. 166-293.000.

Smith, Robert Neal, to United States of America, Navy. Isolation amplifier for resistive and inductive loads. 4,037,147, Cl. 318-632.000.

Smith, William Harold: *See*—
Fegan, Frank Joseph; and Smith, William Harold, 4,036,253, Cl. 137-556.000.

Snam Progetti, S.p.A.: *See*—
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,037,041, Cl. 526-97.000.

Snyder, Paul W., Jr.: *See*—
Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,036,779, Cl. 252-417.000.

So. Ci. Bre.: *See*—
Dulou, Raymond; Magnin, Pierre; and Bechtel, Pierre, 4,036,884, Cl. 260-586.00G.

Soares, James R., to Biological Developments, Inc. Barbituric acid antigenic conjugates, their preparation, antibodies and use. 4,036,823, Cl. 260-112.00R.

Societa' Farmaceutici Italia: *See*—
Foglio, Maurizio; Franceschi, Giovanni; and Suarato, Antonino, 4,036,835, Cl. 260-243.00C.

Societe Anonyme Francaise du Ferodo: *See*—
Neveux, Rene, 4,036,288, Cl. 165-69.000.

S.A. Sidmar: *See*—
Bernet, Henri Georges; and Martens, Theophile, 4,036,603, Cl. 44-13.000.

Societe Chimique des Charbonnages: *See*—
Couderc, Pierre; and Hilmoine, Serge, 4,036,888, Cl. 260-602.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Faure, Jean-Christian, 4,035,924, Cl. 34-5.000.

Societe de Diffusion Neiman: *See*—
Neiman, Michel, 4,036,393, Cl. 220-206.000.

Societe Francaise d'Etude d'Installations Siderurgiques Sofresid: *See*—
Bernet, Henri Georges; and Martens, Theophile, 4,036,603, Cl. 44-13.000.

Societe Franco-Americaine de Constructions Atomiques-Framatome: *See*—
Weilbacher, Jean-Claude; and Bodson, Guy, 4,036,686, Cl. 176-19.00R.

Societe Nationale Elf Aquitaine (Production): *See*—
Blanc, Jean-Henri; Pornin, Rene; and Voirin, Robert, 4,037,035, Cl. 526-16.000.

Soderberg, Bo, to Asea Aktiebolag. Means in a motor-driven rail-vehicle. 4,037,143, Cl. 318-52.000.

Soderlind, Richard Leroy; and Lund, Glenn A. L., to Sperry Tech Corporation. Anti-injection paint spray nozzles. 4,036,438, Cl. 239-288.500.

Sokolov, Vasily Ivanovich: *See*—
Ivin, Jury Filoretovich; Levischev, Arkady Nikolaevich; and Sokolov, Vasily Ivanovich, 4,036,429, Cl. 233-27.000.

Soldate, Albert M. Mechanical vibrator for use in material transport apparatus and the like. 4,036,598, Cl. 23-288.00B.

Soligno, Vincenzo, to Breda Termomeccanica S.P.A. Supporting grid for pipes. 4,036,461, Cl. 248-68.00R.

Solomon, Elias E., to Gulf & Western Manufacturing Company (Systems). Supervision of transducers. 4,037,222, Cl. 340-261.000.

Solomovitz B., Yancu. Anti-vandalism protective attachment device for a pay telephone. 4,037,067, Cl. 179-184.000.

Soloviev, Igor Nikolaevich: *See*—
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F.

Somekh, Sasson Roger: *See*—
Coquin, Gerald Allan; Maldonado, Juan Ramon; Maydan, Dan; and Somekh, Sasson Roger, 4,037,111, Cl. 250-505.000.

Sony Corporation: *See*—
Amano, Yoshifumi, 4,037,224, Cl. 340-324.00M.
Doi, Toshitada, 4,037,052, Cl. 179-1.0MF.
Ishi, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu, 4,035,908, Cl. 29-597.000.
Mori, Hiroshi, 4,036,551, Cl. 350-160.00R.
Sato, Teruo; and Nakamura, Hideo, 4,037,055, Cl. 179-15.0BT.
Suzuki, Tadao, 4,037,169, Cl. 330-35.000.
Tanaka, Yoshinori; and Narahara, Hisaaki, 4,037,247, Cl. 358-4.000.
Yasuda, Hiroshi, 4,037,064, Cl. 179-156.00R.

Soram S.A.: *See*—
Gillard, Claude; and Mauroy, Marcel, 4,036,222, Cl. 128-2.080.

SOS Consolidated, Inc.: *See*—
Westhoff, Loren N., 4,036,411, Cl. 222-413.000.

South African Coal, Oil & Gas Corporation Limited: *See*—
Brink, Andries; Kleynjan, Cornelis; and Beukes, Quintin John, 4,036,730, Cl. 208-8.000.

Southwestern Manufacturing Co.: *See*—
Athy, Lawrence F., Jr., 4,036,106, Cl. 91-5.000.

Southwire Company: *See*—
Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., 4,036,450, Cl. 242-129.000.

Soya, Tatsunori: *See*—
Okumura, Kimio; Soya, Tatsunori; Kauchi, Yosuke; and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000.

Spani, Hans: *See*—
Stutz, Hansruedi; and Spani, Hans, 4,036,445, Cl. 242-37.00A.

Spartus Corporation: *See*—
Jauch, Christian M. J., 4,036,004, Cl. 58-9.000.
Jauch, Christian M. J., 4,036,005, Cl. 58-9.000.

Spaziante, Placido M.: *See*—
Nidola, Antonio de Nora, Vittorio; and Spaziante, Placido M., 4,037,032, Cl. 429-198.000.

Spector, George: *See*—
Aldridge, Bobby V.; and Spector, George, 4,037,081, Cl. 219-387.000.

Spectron Corporation: *See*—
Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,037,186, Cl. 335-206.000.

Speicher, Edwin W., to M. E. Cunningham Company. Plate marking apparatus. 4,036,127, Cl. 101-5.000.

Speidel, Blasius. Blood pressure indicator gauge. 4,036,061, Cl. 73-410.000.

Spencer, Dudley W. C. Horseshoe manufacture. 4,036,302, Cl. 168-4.000.

Sperry Rand Corporation: *See*—
Edelberg, Murray; and Schissler, Lloyd R., 4,037,205, Cl. 364-900.000.
Phillips, Edwin R.; and Stankiewicz, Raymond J., 4,036,175, Cl. 118-651.000.

Sperry Tech Corporation: *See*—
Soderlind, Richard Leroy; and Lund, Glenn A. L., 4,036,438, Cl. 239-288.500.

Spetzler, Edgar: *See*—
Klapdar, Wilhelm; Richter, Helmut; Spetzler, Edgar; and Wendorff, Jochen, 4,036,635, Cl. 75-49.000.

Spiegel, Jack. Portable clothes dryer. 4,035,927, Cl. 34-163.000.

Spiers, Ronald Geoffrey: *See*—
Hensel, Paul Christopher; and Spiers, Ronald Geoffrey, 4,036,419, Cl. 225-96.500.

Spiral Step Tool Company: *See*—
Breitenstein, Charles T.; and Nicolaus, Frank G., 4,036,242, Cl. 133-4.00R.

Spitzer, Robert, to Du Pont de Nemours, E. I., and Company. Electrolytic cells and processes. 4,036,714, Cl. 204-99.000.

Sprague Electric Company: *See*—
Clement, Warren J., 4,035,905, Cl. 29-570.000.
Poole, Ralph B., 4,037,142, Cl. 361-433.000.

Sprague, George R., to Dayco Corporation. Carpet underlay comprising foamed scrap particles. 4,037,013, Cl. 428-310.000.

Sprague, Michael Jolyon: *See—*
Engelbach, Heinz; and Sprague, Michael Jolyon, 4,036,860, Cl. 260-369.000.

Springer, Robert H.: *See—*
O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., 4,036,840, Cl. 260-256.50R.

Spumalit-Anstalt: *See—*
Prodel, Ulrich, 4,036,391, Cl. 220-21.000.

Square D Company: *See—*
Kennedy, Richard T.; Quitschau, Algird R.; and Kettelson, Ernest S., 4,036,396, Cl. 220-242.000.

Stahl, Horst: *See—*
Troetscher, Otto; Wiedmann, Erwin; Stahl, Horst; and Forberich, Helmut, 4,036,762, Cl. 250-199.000.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. 2-(N-thienylmethyl-phenylamino)-imidazolines-(2) and salts thereof. 4,036,972, Cl. 424-273.000.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Opening and cleaning apparatus for an open end spinning unit. 4,035,871, Cl. 19-200.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,035,871, Cl. 19-200.000.

Stahnecker, Erhard: *See—*
Keppler, Hans Georg; Stahnecker, Erhard; and Moeller, Rolf, 4,036,794, Cl. 260-2.50B.

Stalley, Anthony Donald, to Quantel Limited. High speed digital information storage system. 4,037,203, Cl. 364-900.000.

Stambaugh, Sherwood C.; and Hephner, Marie K. Rotatable shoe rack. 4,036,367, Cl. 211-37.000.

Stamicarbon B.V.: *See—*
Basten, Albert T.; and Dreissen, Hubert H., 4,036,441, Cl. 241-20.000.
Boesten, Wilhelmus H. J., 4,036,852, Cl. 260-326.450.
de Rooij, Abraham H.; and Goettsch, Reijer, 4,036,830, Cl. 260-239.30A.

Stanadyne, Inc.: *See—*
Clark, Calvin M.; and D'Attilio, Americo P., 4,036,560, Cl. 408-204.000.

Standal, Norman S. Self-propelled linear irrigation system. 4,036,436, Cl. 239-183.000.

Standard Oil Company: *See—*
Greene, Janice L., 4,036,836, Cl. 260-326.5FN.

Standard Oil Company (Indiana): *See—*
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,036,301, Cl. 166-293.000.

Stanfill, Herman F., to Union Oik Company of California. Method for placing a corrosion test specimen into an environment to be tested. 4,036,591, Cl. 23-230.00C.

Stankiewicz, Raymond J.: *See—*
Phillips, Edwin R.; and Stankiewicz, Raymond J., 4,036,175, Cl. 118-651.000.

Stannett, Vivian Thomas: *See—*
Williams, Joel Lawson; and Stannett, Vivian Thomas, 4,036,588, Cl. 8-130.100.

Stapley, Edward O.; and Mata, Justo M., to Merck & Co., Inc. Preparation of antibiotics by fermentation. 4,036,696, Cl. 195-80.00R.

Stark, Troy Cecil: *See—*
Broyles, Douglas Wright; and Stark, Troy Cecil, 4,037,231, Cl. 346-108.000.

Stauffer Chemical Company: *See—*
Baker, Don R., 4,036,958, Cl. 424-245.000.
Grindstaff, Donald A., 4,036,999, Cl. 426-549.000.
Pallos, Ferenc M.; and Baker, Don R., 4,036,628, Cl. 71-86.000.
Shim, Kyung S., 4,036,789, Cl. 260-2.5AR.

STEAG Aktiengesellschaft: *See—*
Zimmermann, Fritz; and Lenk, Arthur, 4,036,606, Cl. 48-77.000.

Steckler, Robert, to Plastomedical Sciences, Inc. Anionic hydrogels based on heterocyclic N-vinyl monomers. 4,036,788, Cl. 260-2.10E.

Steel Heddle Manufacturing Company: *See—*
Kaufmann, Frank H., 4,036,263, Cl. 139-91.000.
Kaufmann, Frank H., 4,036,264, Cl. 139-92.000.

Steger, John F., to Morton-Norwich Products, Inc. Acidic hydrosols and process for coating therewith. 4,037,019, Cl. 428-469.000.

Stein, David L.: *See—*
Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.

Stendel, Wilhelm: *See—*
Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl. 424-217.000.

Stephenson, Peter Robert Norman, to Hawker Siddeley Dynamics Limited. Noise and drift correcting amplifier circuit for a live-scan imaging system. 4,036,763, Cl. 250-214.00C.

Sterling Glove Machinery Ltd.: *See—*
Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, 4,036,415, Cl. 223-40.000.

Steroid Development Company Establishment: *See—*
Loken, Bjarte; MacDonald, Peter Lindsay; and Bigatti, Ettore, 4,036,831, Cl. 260-239.55D.

Steving, Gerald: *See—*
Schwartz, Bradford Clyde; Silkensen, Ralph Donald; and Steving, Gerald, 4,036,723, Cl. 204-192.0EC.

Stewart, Roger Green; and Seixo de Melo Paulino, Marceano, to RCA Corporation. Tri-state logic circuit. 4,037,114, Cl. 307-205.000.

Stiefel Laboratories, Inc.: *See—*
Stiefel, Werner K., 4,036,991, Cl. 424-365.000.

Stiefel, Werner K., to Stiefel Laboratories, Inc. Skin treatment with emollient cis-6-hexadecenoic acid or derivatives. 4,036,991, Cl. 424-365.000.

Stillman, Allen M.; and Stillman, Theodore. Color changer for spotlights. 4,037,097, Cl. 240-3.100.

Stillman, Theodore: *See—*
Stillman, Allen M.; and Stillman, Theodore, 4,037,097, Cl. 240-3.100.

Stilve, Victor Reingoldovich: *See—*
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F.

Stine, Robert David, to International Telephone and Telegraph Corporation. Intercom system for a key telephone system. 4,037,058, Cl. 179-99.000.

Stine, Robert David, to International Telephone and Telegraph Corporation. Intercom system for a key telephone system. 4,037,059, Cl. 179-99.000.

Stirling, Irene, to Beecham Group Limited. 2,12-Dioxo-7-hydroxymethyl-9-phenyl-1-aza-5,8,11-trioxotetracyclo[9.2.0.0^{6,12}0.^{6,9}]tridecane. 4,036,969, Cl. 424-272.000.

Stitt, Thomas Detlor: *See—*
Bailey, Ronald Barry; and Stitt, Thomas Detlor, 4,037,145, Cl. 318-341.000.

Stockhaus, Klaus: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 4,036,972, Cl. 424-273.000.

Stockwell, Richard Kent: *See—*
Osborne, Thomas E.; and Stockwell, Richard Kent, 4,037,092, Cl. 235-156.000.

Stolki, Thomas J., to Monsanto Company. Preparation of molecularly oriented containers using reheat process. 4,036,927, Cl. 264-97.000.

Stoloff, Alfred: *See—*
Larkin, William A.; and Stoloff, Alfred, 4,036,866, Cl. 260-429.700.

Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft. O,S,N-tri-aliphatic hydrocarbon-thionothiolphosphoric acid ester amides and pesticidal composition and method. 4,036,956, Cl. 424-210.000.

Stone City Products, Inc.: *See—*
Rankin, Armand T., 4,036,761, Cl. 210-474.000.

Storck, Friedrich; Kunesch, Rudolf; and Missbach, Gernot, to Hilti Aktiengesellschaft. Device for dependently supporting an object. 4,036,460, Cl. 248-59.000.

Stotts, Lewis Everett: *See—*
Atkins, James Damon; Murphy, Charles Allen; and Stotts, Lewis Everett, 4,037,213, Cl. 364-200.000.

Strangio, Vincent A.; Riegel, Herbert; and Sze, Morgan C., to Lummus Company, The. Production of hexachlorocyclopentadiene. 4,036,897, Cl. 260-648.00C.

Strangio, Vincent A., to Lummus Company, The. Molten salt lift gas system for production of chlorinated hydrocarbons. 4,036,900, Cl. 260-659.00R.

Strangio, Vincent A.: *See—*
Riegel, Herbert D.; Schindler, Harvey D.; and Strangio, Vincent A., 4,036,776, Cl. 252-187.00R.

Straub, John Frederick, to Du Pont de Nemours, E. I., and Company. Selective solar energy absorption. 4,036,206, Cl. 126-270.000.

Streck, Roland: *See—*
Kupper, Friedrich-Wilhelm; and Streck, Roland, 4,036,858, Cl. 260-348.50L.

Strehlow, Wolfgang H.: *See—*
Lee, Pui Kum; and Strehlow, Wolfgang H., 4,036,552, Cl. 350-97.000.

Strelioff, William P.; Elliott, William S.; and Johnson, Dale, to Senstek Ltd. Grain loss monitor. 4,036,065, Cl. 73-432.00R.

Stricharczuk, Paul Thomas, to B. F. Goodrich Company, The. Thermoplastic polymer blends of EP or EPDM polymer with crystalline polypropylene. 4,036,912, Cl. 260-897.00A.

Strickland, Claudius R., Jr., to American Hoist & Derrick Company. Baled wood chips. 4,036,359, Cl. 206-83.500.

Stromberg-Carlson Corporation: *See—*
Richards, Glenn L., 4,037,170, Cl. 330-69.000.

Strong, Jerry G., to Mobil Oil Corporation. 3-(3,4-Epoxy-4-methylcyclohexyl)butyl esters. 4,036,629, Cl. 71-88.000.

Strope, Daniel J., to Phillips Petroleum Company. Isomerization of allenes in a hydrocarbon stream using magnesium oxide catalyst. 4,036,904, Cl. 260-681.50R.

Strow, Lawrence Evans; and Bolth, Franklin Anderson, to Minerec Corporation. Flotation with amine-stabilized dialkyl dithiophosphates. 4,036,746, Cl. 209-166.000.

Struthers Patent Corporation: *See—*
Ganiaris, Neophytos, 4,036,619, Cl. 62-123.000.

Stryker Corporation: *See—*
Rhodes, Earl H., Jr., 4,036,236, Cl. 128-317.000.

Stuart, Alexander, to Burroughs Wellcome Co. Pharmaceutical compositions containing pteridines. 4,036,961, Cl. 424-251.000.

Stude, Duane L., to Dow Chemical Company, The. Cement composition. 4,036,659, Cl. 106-90.000.

Sturkey, William Cleere: *See—*
Aurich, Christoph W.; Sturkey, William Cleere; and Turner, James Keith, 4,036,038, Cl. 68-5.00C.

Sturm, Winfried: *See—*
Braun, Johannes; and Sturm, Winfried, 4,035,981, Cl. 53-21.00R.

Stute, Manfred: *See—*
Tank, Eggert; and Stute, Manfred, 4,036,293, Cl. 165-134.000.
Stutz, Hansruedi; and Spani, Hans, to Aktiengesellschaft Gebruder Loepfe. Circuit arrangement for monitoring the operation of an electronic yarn clearer. 4,036,445, Cl. 242-37.00A.
Suarato, Antonino: *See—*
Foglio, Maurizio; Franceschi, Giovanni; and Suarato, Antonino, 4,036,835, Cl. 260-243.00C.
Sucro, Jost S.: *See—*
Benasutti, Louis D.; and Sucro, Jost S., 4,036,620, Cl. 62-338.000.
Sugimoto, Masakatsu: *See—*
Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904, Cl. 29-563.000.
Sugino, Toshio: *See—*
Yoshimori, Ikuo; Nanao, Teruaki; and Sugino, Toshio, 4,036,248, Cl. 137-271.000.
Sugiyama, Iwakichi; Takaoka, Yukihisa; and Endo, Kiyoshi, to Matsumoto Seiyaku Kogyo Kabushiki Kaisha. Process of drying and hardening film-forming material. 4,036,796, Cl. 260-22.0CA.
Sugiyama, Kiyoshi: *See—*
Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, 4,036,990, Cl. 424-361.000.
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich. Machine for edge forming of sheets for welding. 4,036,105, Cl. 90-24.00F.
Sulzer Brothers Limited: *See—*
Mandrin, Charles, 4,036,028, Cl. 62-52.000.
Sumita, Tadayuki: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,036,922, Cl. 264-35.000.
Sumitomo Bakelite Company, Limited: *See—*
Ishii, Ko; and Yoshida, Tadamasa, 4,037,020, Cl. 428-518.000.
Nakazato, Tetsuo; Kamon, Shunji; Tokuda, Koichi; and Honma, Keisuke, 4,035,987, Cl. 53-133.000.
Sumitomo Chemical Company, Limited: *See—*
Yamada, Koichi; Hashimoto, Tadanori; and Furumi, Yoshinori, 4,036,655, Cl. 106-77.000.
Sun Chemical Corporation: *See—*
Adams, William R., 4,037,021, Cl. 428-522.000.
Rothmayer, Jules, 4,036,652, Cl. 106-308.00N.
Sunbeam Equipment Corporation: *See—*
Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,036,478, Cl. 266-133.000.
Sundermann, Rudolf: *See—*
Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R.
Sundstrand Corporation: *See—*
Tennis, Francis Henry, 4,036,245, Cl. 137-117.000.
Sunnen Products Company: *See—*
Vanderwal, Frank E., Jr., 4,035,959, Cl. 51-34.00K.
Sutelan, Franklin S. Bisectional architectural structure 4,035,973, Cl. 52-263.000.
Suter, Xaver, to Maschinenfabrik Schweiter AG. Transfer apparatus for gripping and holding a spinning cop. 4,036,353, Cl. 198-486.000.
Suter, Xaver, to Maschinenfabrik Schweiter AG. Apparatus for pneumatically separating a foot lap from a spinning cop. 4,036,444, Cl. 242-35.60E.
Sutter Hospitals Medical Research Foundation: *See—*
Hillsman, Deane; Cook, Albert M.; and Simes, James G., 4,036,221, Cl. 128-145.600.
Suxov, Gennady Ilich: *See—*
Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davydovich; Suxov, Gennady Ilich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000.
Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for the preparation of maleic anhydride. 4,036,780, Cl. 252-437.000.
Suzuki, Tadao, to Sony Corporation. Transistor amplifier. 4,037,169, Cl. 330-35.000.
Suzuki, Toshio: *See—*
Ohmae, Tsutomu; Yano, Hideo; and Suzuki, Toshio, 4,037,144, Cl. 318-338.000.
Suzuki, Yukio: *See—*
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Svenska Aktiebolaget Bromsregulator: *See—*
Dahlkvist, Nils Goran; Axelsson, Lars Bengt; and Sander, Nils Borje Lennart, 4,036,111, Cl. 92-29.000.
Kraft, Uno Ingemar, 4,036,533, Cl. 303-6.00A.
Sander, Nils Borje Lennart, 4,036,332, Cl. 188-196.00D.
Svenska Textilforskningsinstitutet: *See—*
Shishoo, Roshan Lal; and Alfredsson, Sara Inga-Lill, 4,036,924, Cl. 264-89.000.
SW (Delaware), Inc.: *See—*
Cheatham, Joseph F., 4,035,878, Cl. 26-87.000.
Sweat, Tommy: *See—*
Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, 4,035,998, Cl. 56-27.500.
Sweda International, Inc.: *See—*
Feldman, Edward; and Lupinacci, George, 4,036,349, Cl. 197-151.000.
Swihart, Patrick S., Sr. Subsurface flow control apparatus and method. 4,036,297, Cl. 166-250.000.
Swisstone Corporation: *See—*
Fishbein, Harry, 4,035,948, Cl. 46-189.000.
Sylvest, Aage C.: *See—*
Deane, Richard; and Sylvest, Aage C., 4,037,191, Cl. 340-28.000.
Symons Corporation: *See—*
Van Meter, Richard A., 4,036,466, Cl. 249-18.000.
Synergistics, Inc.: *See—*
Halpern, Alfred; and Sasmor, Ernest J., 4,036,951, Cl. 424-60.000.
Syntex (U.S.A.) Inc.: *See—*
Lanzilotta, Raymond P., 4,036,876, Cl. 260-514.00D.
McCarty, James C.; and Mendola, Dominick, 4,036,176, Cl. 119-3.000.
Walker, Keith A. M.; and Marx, Michael, 4,036,970, Cl. 424-273.000.
Walker, Keith A. M.; and Marx, Michael, 4,036,973, Cl. 424-273.000.
Walker, Keith A. M.; and Marx, Michael, 4,036,974, Cl. 424-273.000.
Walker, Keith A. M.; and Unger, Stefan Howard, 4,036,975, Cl. 424-273.000.
Systematics, Inc.: *See—*
Kuehn, Andrew, III, 4,036,200, Cl. 123-148.00E.
Systron Donner Corporation: *See—*
Pickton, Shailer T.; and Dean, Gordon B., 4,037,164, Cl. 328-187.000.
Szabo, Jorge Luis Jose: *See—*
Amato, Jose; Propker, Marta; Pongracz, Magdalena Julia Beatriz; and Szabo, Jorge Luis Jose, 4,036,985, Cl. 424-320.000.
Szabo, Lajos: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,036,841, Cl. 260-293.530.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Indolo[2-,3α]quinolizine derivatives. 4,036,841, Cl. 260-293.530.
Sze, Morgan C.: *See—*
Strangio, Vincent A.; Riegel, Herbert; and Sze, Morgan C., 4,036,897, Cl. 260-648.00C.
Szporny, Laszlo: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,036,841, Cl. 260-293.530.
Taenzi, Igarashi; and Toshio, Tsubota, to Mitsubishi Jukogyo Kabushiki Kaisha. Automatic inspection apparatus. 4,036,373, Cl. 214-1.0BB.
Tagata, Genichi: *See—*
Abe, Kiyomi; and Tagata, Genichi, 4,035,933, Cl. 35-48.00R.
Taggart, Lewis W., to Kaiser Aluminum & Chemical Corporation. Method of manufacturing a sacrificial anode rod assembly. 4,035,903, Cl. 29-458.000.
Taguchi, Tetsuya: *See—*
Tunekawa, Tokuichi; Nakamoto, Soichi; and Taguchi, Tetsuya, 4,037,234, Cl. 354-24.000.
Taira, Kaoru: *See—*
Sami, Hiroshi; Taira, Kaoru; and Kumai, Teruo, 4,036,188, Cl. 123-41.310.
Taisei Corporation: *See—*
Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,036,922, Cl. 264-35.000.
Takada, Juichiro, legal authorized heir: *See—*
Takada, Takezo, deceased; and Takada, Juichiro, legal authorized heir, 4,036,322, Cl. 180-82.00C.
Takada, Shigetaka: *See—*
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,036,186, Cl. 123-32.0EA.
Takada, Takezo, deceased; and by Takada, Juichiro, legal authorized heir. Automatic locking safety belt retractor reel. 4,036,322, Cl. 180-82.00C.
Takagawa, Minoru: *See—*
Fujiyama, Susumu; Takagawa, Minoru; and Kajiyama, Shiro, 4,036,885, Cl. 260-599.000.
Takagi, Tohru, to Kansai Paint Co., Ltd. Corona producing a planographic printing sheet. 4,036,136, Cl. 101-467.000.
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, to Nissan Chemical Industries, Ltd. Soil fungi inhibiting agent. 4,036,984, Cl. 424-311.000.
Takaishi, Naotake: *See—*
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,036,892, Cl. 260-617.00F.
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Tsuchihashi, Kiyoshi; and Takaishi, Naotake, 4,036,893, Cl. 260-617.00F.
Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Dual fastener slider. 4,035,876, Cl. 24-205.00R.
Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Chair. 4,036,524, Cl. 297-219.000.
Takamizawa, Hideo: *See—*
Katoh, Hidehiko; Kajiwara, Yuji; and Takamizawa, Hideo, 4,037,168, Cl. 330-31.000.
Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, to Tokyo Shibaura Electric Co. Ltd. Rechargeable nickel-zinc battery. 4,037,033, Cl. 429-206.000.
Takaoka, Yukihisa: *See—*
Sugiyama, Iwakichi; Takaoka, Yukihisa; and Endo, Kiyoshi, 4,036,796, Cl. 260-22.0CA.
Takasaki, Takashi: *See—*
Ikeda, Isumi; and Takasaki, Takashi, 4,036,993, Cl. 426-7.000.

Takasawa, Yoshio: *See*—
Toyama, Teruhiko; and Takasawa, Yoshio, 4,036,630, Cl. 71-88.000.

Takata, Yoshinori, to Hitachi, Ltd. Liquid chromatographical method. 4,036,704, Cl. 204-1.00T.

Takeda Chemical Industries, Ltd.: *See*—
Hori, Masatake; and Kikuchi, Shintaro, 4,036,747, Cl. 210-22.00A.
Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, 4,036,948, Cl. 424-32.000.

Takeda, Toshio: *See*—
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,036,096, Cl. 84-1.010.

Takeda, Tsuginori: *See*—
Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.

Taketomi, Bunsaku. Plug receptacle having a rotatable receptacle member. 4,036,543, Cl. 339-2.00R.

Takeuchi, Yasuhito, to Hewlett-Packard Company. Apparatus for measuring the period and frequency of a signal. 4,037,151, Cl. 324-78.00R.

Talley Industries of Arizona, Inc.: *See*—
Skinner, Everett B.; and Lair, James O., 4,036,456, Cl. 244-122.0AD.

Talmadge, Samuel I. Rotary door latch. 4,036,517, Cl. 292-216.000.

Tamada, Minoru; Shikama, Takashi; and Nakamura, Toshikazu, to Murata Manufacturing Co., Ltd. Positive temperature coefficient semiconductor heating device. 4,037,082, Cl. 219-541.000.

Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for doffing and donning bobbins in spinning machine. 4,036,001, Cl. 57-52.000.

Tamaki, Kanji: *See*—
Shin, Masami; and Tamaki, Kanji, 4,037,261, Cl. 360-78.000.

Tamao, Yoshikuni: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.

Tamura, Tatsuo: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,036,986, Cl. 424-322.000.

Tanaka, Taro: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,036,180, Cl. 123-3.000.

Tanaka, Yoshinori; and Narahara, Hisaaki, to Sony Corporation. Still color television signal recording and reproducing apparatus. 4,037,247, Cl. 358-4.000.

Tani, Sumio: *See*—
Saito, Masumi; Tani, Sumio; Matsui, Shigeaki; and Kasaoka, Shigeaki, 4,036,785, Cl. 252-472.000.

Tank, Eggert; and Stute, Manfred, to Daimler-Benz Aktiengesellschaft. Heat exchanger for gases of greatly varying temperatures. 4,036,293, Cl. 165-134.000.

Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich. Method of and apparatus for eliminating the effect of non-equipotentiality voltage on the hall voltage. 4,037,150, Cl. 324-45.000.

Tarnero, Maurice: *See*—
Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl. 423-488.000.

Tasch, Al F.; and Frye, Robert C., to Texas Instruments Incorporated. Silicon gate CCD structure. 4,035,906, Cl. 29-578.000.

Tate & Lyle Limited: *See*—
Burge, Malcolm Leonard Ernest; and Gill, Heather Ann, 4,037,000, Cl. 426-572.00J.

Taylor, Glen J., to Martin Marietta Corporation. Multilayer circuit board with integral flexible appendages. 4,037,047, Cl. 174-68.500.

Taylor, Michael Gordon: *See*—
Lefkowitz, Michael; and Taylor, Michael Gordon, 4,037,050, Cl. 178-69.00G.

Taylor, Otis Max, to TMC, Inc. Industrial fuel storage and self-blending tank and method. 4,036,402, Cl. 222-1.000.

Teets, Alan R.: *See*—
Lucero, Daniel P.; and Teets, Alan R., 4,036,915, Cl. 261-104.000.

Telectronics SA: *See*—
Matthey, Henri; and Delessert, Georges, 4,036,458, Cl. 242-201.000.

Teledyne Industries, Inc.: *See*—
Blackaby, Benjamin E., 4,037,076, Cl. 219-121.00L.

Telljohann, Rudolf: *See*—
Tetenborg, Konrad; and Telljohann, Rudolf, 4,036,116, Cl. 93-32.000.

Teng, Lina Chen, to Philip Morris Incorporated. Smoking composition. 4,036,237, Cl. 131-17.00R.

Tennis, Francis Henry, to Sundstrand Corporation. Pressure compensated hydraulic control valve. 4,036,245, Cl. 137-117.000.

Tensei Suisan Company, Limited: *See*—
Ikeda, Isumi; and Takasaki, Takashi, 4,036,993, Cl. 426-7.000.

Tension Structures Co.: *See*—
Huddle, Carl F., 4,036,244, Cl. 135-4.00R.

Teplyakov, Mikhail Mikhailovich: *See*—
Korshak, Vasily Vladimirovich; Sergeev, Vladimir Alexandrovich; and Teplyakov, Mikhail Mikhailovich, 4,036,818, Cl. 260-63.00K.

Teraji, Tsutomu: *See*—
Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.

Terasaki, Kaoru: *See*—
Uchida, Ryuichi; Terasaki, Kaoru; and Ogikubo, Masaru, 4,037,060, Cl. 179-100.41K.

Terayama, Toshio, to Kabushiki Kaisha Daini Seikosha. Mechanical filter device. 4,037,179, Cl. 333-71.000.

Terrell Machine Company, The: *See*—
Ferguson, Richard; and Troutman, Kenneth W., 4,035,882, Cl. 28-294.000.

Terzian, John, to Raytheon Company. Microprogram controlled digital processor having addressable flip/flop section. 4,037,202, Cl. 364-200.000.

Tesco Engineering Company: *See*—
Ferguson, Paul M., 4,037,269, Cl. 361-232.000.
Webb, Anthony M., 4,036,468, Cl. 251-84.000.

Tetenborg, Konrad; and Telljohann, Rudolf, to Windmoller & Holscher. Method of stacking flat bags or sacks which are folded about at least two transverse fold lines. 4,036,116, Cl. 93-32.000.

Texaco Development Corporation: *See*—
Brennan, Michael E.; and Yeakey, Ernest L., 4,036,881, Cl. 260-583.00P.
Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., 4,036,880, Cl. 260-570.00D.

Texaco Inc.: *See*—
Crawford, Wheeler C.; Yamamoto, Roy I.; and Cusano, Carmen M., 4,036,768, Cl. 252-51.50A.
Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,766, Cl. 252-51.50A.
Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,767, Cl. 252-51.50A.

Texas Instruments Incorporated: *See*—
Dierschke, Eugene Gustav, 4,037,241, Cl. 357-17.000.
Gosney, William Milton, 4,037,242, Cl. 357-23.000.
Raymond, Joseph H., Jr., 4,037,090, Cl. 235-152.000.
Savarese, Giuseppe, 4,037,217, Cl. 340-173.0SP.
Tasch, Al F.; and Frye, Robert C., 4,035,906, Cl. 29-578.000.
Vandierendonck, Jerry L., 4,037,094, Cl. 235-175.000.

Tezuka, Tohru: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.

Thagard Technology Company: *See*—
Matovich, Edwin, 4,036,181, Cl. 123-3.000.

Thany, Imre, to Raymond Lee Organization, Inc., The, a part interest. Handle device. 4,036,424, Cl. 229-52.00A.

Theeuwes, Felix, to Alza Corporation. Osmotic dispenser with gas generating means. 4,036,228, Cl. 128-260.000.

Theeuwes, Felix: *See*—
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,036,227, Cl. 128-260.000.

Thilly, William G.: *See*—
Levine, David W.; Thilly, William G.; and Wang, Daniel I. C., 4,036,693, Cl. 195-1.800.

Thiokol Corporation: *See*—
Bertozzi, Eugene R.; Barclay, Robert, Jr.; Packer, David H.; and Smith, Daniel J., 4,036,882, Cl. 260-584.00B.

Thomas, John G.: *See*—
Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,036,397, Cl. 220-268.000.

Thomas, Wesley L. Grip assembly for attaching an electric cord to an electric appliance, and the like. 4,036,548, Cl. 339-103.00C.

Thompson, Albert W.: *See*—
Berry, R. Arlen; and Thompson, Albert W., 4,036,380, Cl. 214-305.000.

Thompson, John T.; and Cowan, Arnold A., to Cowan, Arnold A. Adjustable shock absorber. 4,036,335, Cl. 188-319.000.

Thompson, John T.; and Gillemot, George W. Parts comprising a metal strap, U-shaped metal clip, and adjustable clamping means, for making an electrical terminal assembly. 4,036,546, Cl. 339-95.00R.

Thompson, Malcolm J.; Feldmesser, J· lius; and Robbins, William E., to United States of America, Agriculture. Control of nematodes and other helminths. 4,036,987, Cl. 424-325.000.

Thomson-Brandt: *See*—
Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.

Thomson-CSF: *See*—
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Thomson, Francis D., to Owens-Corning Fiberglas Corporation. Polyurethane foam compositions. 4,036,790, Cl. 260-2.5AQ.

Thordarson, Gunnar Gudmund: *See*—
Nordgren, John Lennart; and Thordarson, Gunnar Gudmund, 4,036,143, Cl. 102-70.20R.

Thorn, Lawrence B.: *See*—
Betts, Robert E.; Thorn, Lawrence B.; and Maykut, Albert R., 4,036,013, Cl. 60-271.000.

Thorne, David Edward; and Engel, Kurt, to Beecham Group Limited. Aryloxypyridines. 4,036,844, Cl. 260-295.00R.

Thornton, Leonard: *See*—
Davies, Robert W.; Thornton, Leonard; Veness, Maxwell F.; and Calver, Leonard H., 4,036,117, Cl. 93-51.00R.

Thorsell, Roland H., to Excor, Inc. Saw for cutting truss members,

rafters and the like with dimensional accuracy. 4,036,093, Cl. 83-471.300.
Thumm, Helmut; Reusch, Lothar; and Wahl, Rainer. Thread cutting apparatus and method of operating same. 4,036,086, Cl. 82-24.00R.
Thyssen Niederrhein AG Hutten- und Walzwerke: *See*—
Klapdar, Wilhelm; Richter, Helmut; Spetzler, Edgar; and Wendorff, Jochen, 4,036,635, Cl. 75-49.000.
Tibur Metals, Ltd.: *See*—
Segsworth, Robert Sidney, 4,037,043, Cl. 13-9.00R.
Tiedemann, William H., to Globe-Union Inc. Fluorinated carbon composition and resistor utilizing same. 4,036,786, Cl. 252-511.000.
Tieden, Arthur E.: *See*—
Luukonen, Leroy D.; and Tieden, Arthur E., 4,036,378, Cl. 214-92.000.
Tilbrook, Roger W.: *See*—
Golden, Martin P.; Tilbrook, Roger W.; and Heylmun, Neal F., 4,036,688, Cl. 176-38.000.
Tilson, Edward Arthur; and Mayhew, Raymond Leonard, to Caribonum Limited. Transfer materials. 4,037,012, Cl. 428-304.000.
Timmons, Jay. Panel joining arrangements. 4,035,972, Cl. 52-241.000.
Ting, Hui-tzeng. Clean spark ignition internal combustion engine. 4,036,187, Cl. 123-32.0SP.
Titmus, Robert A.: *See*—
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TMC, Inc.: *See*—
Taylor, Otis Max, 4,036,402, Cl. 222-1.000.
Togo, Shizuo; Ito, Muneo; Nishizawa, Chiharu; and Ohba, Michio, to Mitsubishi Gas Chemical Company, Inc. Process for producing a 2-tertiary-alkyl substituted anthraquinone. 4,036,861, Cl. 260-369.000.
Tokuda, Koichi: *See*—
Nakazato, Tetsuo; Kamon, Shunji; Tokuda, Koichi; and Honma, Keisuke, 4,035,987, Cl. 53-133.000.
Tokyo Kosei Kaken Co. Ltd.: *See*—
Nishio Takuji, 4,035,958, Cl. 51-425.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Ito, Ayao; and Ishida, Akinori, 4,036,217, Cl. 128-2.080.
Kawai, Shinichi; Maeyama, Shigeo; and Shidara, Tokihiko, 4,037,127, Cl. 313-60.000.
Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl. 58-85.500.
Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.
Toman, Donald J., to Tull Aviation Corporation. Multiple carrier modulation synthesis. 4,037,173, Cl. 332-9.00R.
Tomcufcik, Andrew Stephen: *See*—
Curran, William Vincent; Tomcufcik, Andrew Stephen; and Ross, Adma Schneller, 4,036,849, Cl. 260-308.00D.
Tominaga, Akira, to Kansai Paint Co., Ltd. Aqueous cationic coating from amine-epoxy adduct, polyamide, and semiblocked polyisocyanate, acid salt. 4,036,795, Cl. 260-18.0PN.
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Musical tone waveshape generator. 4,036,096, Cl. 84-1.010.
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Tomoegawa Paper Co., Ltd.: *See*—
Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.
Tonomura, Shinji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.
Tornkvist, Rolf E. A. Wave motor comprised of a submerged floating network of chambers formed by walls permitting variable geometry. 4,036,563, Cl. 417-331.000.
Torrington Company, The: *See*—
Ashmead, Albert Sidney; Ross, William Alden; and Shepard, Richard Wilton, 4,036,036, Cl. 66-123.000.
Toshio, Tsubota: *See*—
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Touchette, Claude. Ring puzzle. 4,036,504, Cl. 273-158.000.
Towgood, Dennis A.: *See*—
Friedericy, Johan A.; and Towgood, Dennis A., 4,036,080, Cl. 74-572.000.
Towmotor Corporation: *See*—
Finn, David S., 4,036,342, Cl. 192-109.00F.
Toyama, Teruhiko; and Takasawa, Yoshio, to Mitsui Toatsu Chemicals, Incorporated. Synergistic herbicidal composition for paddy fields. 4,036,630, Cl. 71-88.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Onuma, Kiyoshi, 4,036,082, Cl. 74-781.00R.
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Uemura, Hiroshi, 4,037,193, Cl. 340-59.000.
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Transcale AB: *See*—
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Trapasso, Louis E.; and Juelke, Charles V., to Celanese Corporation. Refluxing water-in-oil emulsion process for preparing water-soluble polyelectrolyte particles. 4,037,040, Cl. 526-88.000.
Traphagan, Seeran M. Book cover and carrying device. 4,036,417, Cl. 224-45.00N.
Trautvetter, Jutta; Weingartz, Albert; and Werner, Lothar, to Henkel & Cie G.m.b.H. Process for the production of a marbled or mottled soap cake and the product of such process. 4,036,775, Cl. 252-134.000.
Triano, Howie: *See*—
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Troetscher, Otto; Wiedmann, Erwin; Stahl, Horst; and Forberich, Helmut, to Carl Zeiss-Stiftung. Wireless remote-control system for a camera or the like. 4,036,762, Cl. 250-199.000.
Trofimov, Valery Alexandrovich: *See*—
Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich; Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich, 4,036,425, Cl. 233-2.000.
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Tucci, Domenick; and Cantalupi, Lewis, 4,037,223, Cl. 340-280.000.
Tucci, Domenick; and Cantalupi, Lewis, to Tucci Corporation. Audible alarm system for an electrical outlet. 4,037,223, Cl. 340-280.000.
Tuckey, James C., to Pacific Erectors Corporation. Secondary sealing device for storage vessel having a floating roof. 4,036,395, Cl. 220-224.000.
Tugwell, Dennis H., to Photo-Lith International. Transfer printing process and article. 4,037,008, Cl. 428-200.000.
Tull Aviation Corporation: *See*—
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Tunekawa, Tokuichi; Nakamoto, Soichi; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. Exposure control system stabilized against temperature variation. 4,037,234, Cl. 354-24.000.
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Pierre, Kenneth Jonas; Tung, Ker-Kong; and Nadj, Henriette, 4,036,697, Cl. 195-99.000.
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Turnbull, John William, to Du Pont de Nemours, E. I., and Company. Poly(meta-phenylene isophthalamide) composition. 4,036,907, Cl. 260-857.00L.
Turner, James E.; and Turner, Louise L. Animal protector. 4,036,179, Cl. 119-96.000.
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Tyrey, Elasco A. Radio-frequency coupler. 4,037,177, Cl. 333-32.000.
Tyus, Philranzo. Passenger transportation system. 4,036,146, Cl. 104-1.00R.
Uchida, Ryuichi; Terasaki, Kaoru; and Ogikubo, Masaru, to Nippon Atsudenki Kabushiki Kaisha t/a Japan Piezo Co., Ltd. Stereophonic pickup cartridge. 4,037,060, Cl. 179-100.41K.
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Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Exposure indicating device for use in multiple exposure control cameras. 4,037,235, Cl. 354-38.000.
Uemura, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Liquid level alarm apparatus for a tank of a vehicle. 4,037,193, Cl. 340-59.000.
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Korr, Abraham L.; Walker, Evan Harris; Dickey, Charles M.; and Bushey, Bransby W., 4,036,140, Cl. 102-38.000.
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Jencks, Craig S., 4,035,846, Cl. 2-413.000.
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Unterstenhofer, Gunter: *See—*
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UOP Inc.: *See—*
Antos, George J., 4,036,742, Cl. 208-139.000.
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Bauer, Carl F., 4,036,208, Cl. 126-271.000.
Broughton, Donald B., 4,036,745, Cl. 208-310.00Z.
Gembicki, Stanley A.; and Aeschbach, Stefan H., 4,036,784, Cl. 252-465.000.
Levy, Joseph; and Christensen, Nils J., 4,036,899, Cl. 260-654.00R.
Pollitzer, Ernest L.; and Hayes, John C., 4,036,741, Cl. 208-139.000.
Rosback, Donald H.; and Neuzil, Richard W., 4,036,744, Cl. 208-310.00Z.
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Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.
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Valenta, Rudolph C., to Oil-Dri Corporation of America. Process for pelletizing sorptive mineral fines. 4,036,928, Cl. 264-118.000.
Valli, Roberto. Egg escalator. 4,036,355, Cl. 198-607.000.
Van Kooten B.V.: *See—*
Schnell, Hans Gunther, 4,036,310, Cl. 173-131.000.
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Welcker, Willy H., 4,035,970, Cl. 52-187.000.
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Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., 4,036,887, Cl. 260-599.000.
Vanderwal, Frank E., Jr., to Sunnen Products Company. Cam operated automatic control for a honing machine. 4,035,959, Cl. 51-34.00K.
Vandierendonck, Jerry L., to Texas Instruments Incorporated. Multifunctional arithmetic and logical unit. 4,037,094, Cl. 235-175.000.
Van Eck, Jack M.: *See—*
Saklikar, Arvind R.; and Van Eck, Jack M., 4,036,174, Cl. 118-623.000.
Van Meter, Richard A., to Symons Corporation. Flying deck-type concrete form installation. 4,036,466, Cl. 249-18.000.
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van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., to International Flavors & Fragrances Inc. Fragrant soap compositions containing alpha-substituted acetaldehyde and ketone. 4,036,774, Cl. 252-132.000.
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Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,035,991, Cl. 56-1.000.
Van Valkenburg, Alvin: *See—*
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Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, to Cor Tech Research Limited. Production of novel thermosetting phenol-formaldehyde resins by controlled acid reaction. 4,036,816, Cl. 260-59.00R.
Vaughan, Christopher D.: *See—*
Karg, Gerhart; and Vaughan, Christopher D., 4,036,241, Cl. 132-7.000.
veba-Chemie AG: *See—*
Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.
Ibing, Gunter; and Haferkorn, Herbert, 4,036,594, Cl. 23-264.000.
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Veitel, Myrtle M.: *See—*
Veitel, Robert D.; and Veitel, Myrtle M., 4,036,577, Cl. 431-35.000.
Veitel, Robert D.; and Veitel, Myrtle M. Candle snugger. 4,036,577, Cl. 431-35.000.
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Vending Components, Inc.: *See—*
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Veness, Maxwell F.: *See—*
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VerBurg, David L. Method for freeze forming meat products. 4,036,997, Cl. 426-272.000.
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Veth, George J.; and Noiles, Douglas G., to United States Surgical Corporation. Temperature, pulse and respiration detection apparatus. 4,036,211, Cl. 128-2.00R.
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Vierra, Frank C.; and Vierra, Joyce L., to Raymond Lee Organization, Inc., The, a part interest. Body massaging and reducing belt. 4,036,491, Cl. 272-119.000.
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Vierra, Frank C.; and Vierra, Joyce L., 4,036,491, Cl. 272-119.000.
Viro, Felix; and Mourning, Michael C., to GAF Corporation. Diffusion transfer color process using lactone or sultone ring containing lipophilic non-diffusing color formers which yield diffusing dyes. 4,036,643, Cl. 96-29.00D.
Virtanen, Unto: *See—*
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Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, to Bayer Aktiengesellschaft. Process for the production of nitro derivatives of aromatic compounds. 4,036,838, Cl. 260-251.00R.
Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, to Bayer Aktiengesellschaft. Process for preparing 2-methylpropane-1,3-diol. 4,036,895, Cl. 260-635.00R.
Voges, Dieter; Winderl, Siegfried; and Mueller, Herbert, to BASF Aktiengesellschaft. Manufacture of isomer-free 3-methylbutylamine. 4,036,883, Cl. 260-585.00B.
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Volkner, Wolfgang; and Schmedemann, Helmuth, to Licentia Patent-Verwaltungs-G.m.b.H. Aircraft de-icing. 4,036,457, Cl. 244-134.00D.
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von Recklinghausen, Daniel R., to Electro Audio Dynamics, Inc. Planar pattern voice coil audio transducer. 4,037,061, Cl. 179-115.5PV.
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Wacker-Chemie GmbH: *See—*
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Waddell, Jerry D.; and Scheeter, John J., to ACF Industries, Incorporated. Fluidizing outlet. 4,036,532, Cl. 302-53.000.
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Fleagle, Joseph E., 4,036,537, Cl. 303-106.000.
Quon, Donald S., 4,036,536, Cl. 303-96.000.
Wagner, Heinz. Hip capitulum cap for a hip joint prosthesis. 4,035,848, Cl. 3-1.913.
Wagner, Joseph P.; and Jackson, Byron L., to Robertshaw Controls Company. Thermally operated control device and method of making the same. 4,036,433, Cl. 236-100.000.
Wagner, Karl; and von Fischern, Bernhard, to AGFA-Gevaert, A.G. Visual exposure indicator in photographic apparatus. 4,037,232, Cl. 354-23.00R.
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Korr, Abraham L.; Walker, Evan Harris; Dickey, Charles M.; and Bushey, Bransby W., 4,036,140, Cl. 102-38.000.
Korr, Abraham L.; Walker, Evan Harris; and Dickey, Charles M., 4,036,141, Cl. 102-38.000.
Walker, John E., to Calspan Corporation. Process for the interpretation of remotely sensed data. 4,037,048, Cl. 358-113.000.
Walker, Keith A. M.; and Marx, Michael, to Syntex (U.S.A.) Inc. Imidazol-1-yl propane derivatives. 4,036,970, Cl. 424-273.000.
Walker, Keith A. M.; and Marx, Michael, to Syntex (U.S.A.) Inc. Imidazol-1-yl propane derivatives. 4,036,973, Cl. 424-273.000.
Walker, Keith A. M.; and Marx, Michael, to Syntex (U.S.A.) Inc. 1-{2'-[R'-Thio(oxy)]-3'-(R²-thio(oxy)]propyl}imidazoles. 4,036,974, Cl. 424-273.000.
Walker, Keith A. M.; and Unger, Stefan Howard, to Syntex (U.S.A.) Inc. 1-[2-(1-Adamantyl)-2-(R-thio)ethyl]imidazoles and 1-[2-(1-adamantyl)-2-(R-oxy)ethyl]imidazoles. 4,036,975, Cl. 424-273.000.
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Walton, Lewis Anthony, to Babcock & Wilcox Company, The. Nuclear fuel element nut retainer cup. 4,036,692, Cl. 176-76.000.
Wang, Daniel I. C.: *See—*
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Ward, Derek. Wire wrapping apparatus. 4,036,268, Cl. 140-124.000.
Ward, John W., to Union Oil Company of America. Catalytic cracking process using ammonia-stable zeolite catalyst. 4,036,739, Cl. 208-120.000.
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Watson, W. Gary; and Breedis, John F., to Olin Corporation. Copper base alloy containing titanium, antimony and chromium. 4,036,642, Cl. 75-164.000.
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Webb, Anthony M., to Tesco Engineering Company. Butterfly valve with self energizing seal. 4,036,468, Cl. 251-84.000.
Webb, John Edmund Richard, to Hydaroll Limited. Conveyors. 4,036,345, Cl. 193-35.0SS.
Weber, Heinz, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for transporting loads, especially for belt driving stations in open pit mining. 4,036,377, Cl. 214-512.000.
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Webster, Robert A. Hardness testing device. 4,036,048, Cl. 73-81.000.
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Weilbacher, Jean-Claude; and Bodson, Guy, to Societe Franco-Americaine de Constructions Atomiques-Framatome. Apparatus for examining the fuel rods of a nuclear reactor. 4,036,686, Cl. 176-19.00R.
Weimar, Peter; and Bauer, Franz, to Gesellschaft fur Kernforschung m.b.H. Corrosion-resistant turbine blades and method for producing them. 4,036,601, Cl. 428-663.000.
Weiner, Joel Alan, to RCA Corporation. Electroless copper plating bath. 4,036,651, Cl. 106-1.000.
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Weissman, Eugene Y.: *See*—
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Welcker, Willy H., to Van Byelvelt, Rudi. Prefabricated modular helical escape structure for multiple story buildings. 4,035,970, Cl. 52-187.000.

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Weslake, Henry. Internal combustion engines. 4,036,202, Cl. 123-32.0ST.

Westbrook, Henry, III: *See*—
Bright, Kenneth G., 4,036,270, Cl. 144-208.00E.

Westbrook, Robert L.: *See*—
Bright, Kenneth G., 4,036,270, Cl. 144-208.00E.

Westell, William E., to Baird-Atomic, Inc. Ratio detector. 4,037,161, Cl. 328-133.000.

Westermann, Peter Henry, to British Petroleum Company Limited, The. Compositions containing polychloroprene. 4,036,799, Cl. 260-28.50B.

Western Gear Corporation: *See*—
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Hine, Louis P., Jr., 4,036,292, Cl. 165-122.000.
Lewis, Arthur M., 4,037,219, Cl. 340-204.000.
Mole, Cecil J.; and Haller, Henry E., III, 4,037,123, Cl. 310-52.000.
Moore, Robert A.; and Cooper, Herbert Warren, 4,037,174, Cl. 333-30.00R.

Westling, Wayne A. Rapid transit system. 4,036,147, Cl. 104-23.00R.

Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, to Bayer Aktiengesellschaft. Herbicidal agents. 4,036,632, Cl. 71-93.000.

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Wheatley, Thomas. Full bore pipeline valve apparatus. 4,036,252, Cl. 137-527.800.

Whitchurch, Donald G., to Elco Industries, Inc. Joint securing an article to particle board. 4,036,559, Cl. 403-405.000.

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White, Clarence E., to Miner Enterprises, Inc. Fabricated hopper car outlet door frame. 4,036,149, Cl. 105-280.000.

White, David Laverne, to Alto Corporation. Endless conveyor. 4,036,352, Cl. 198-778.000.

Whitener, Philip C., to Boeing Company, The. Air-cargo liner. 4,036,455, Cl. 244-118.00R.

Whitener, Philip C.: *See*—
Hanson, Carl V.; and Whitener, Philip C., 4,036,257, Cl. 137-614.060.

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Wilder, Paul R.; and Wood, Chester W., to Dover Corporation. Fluid dispensing nozzle. 4,036,259, Cl. 137-801.000.

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Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.

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Wilkens, Kurt: *See*—
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Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., to Cotton Incorporated. Method for the continuous feeding of palletized fiber materials. 4,035,869, Cl. 19-80.00R.

Wilkinson, Norman, to Lucas Electrical Company Limited. Direction indicator switch. 4,036,817, Cl. 200-61.270.

Wilks Scientific Corporation: *See*—
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Willenbacher, Erich: *See*—
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Williams, David, to United States of America, Army. Obscuration fuze and sensor. 4,036,142, Cl. 102-70.20R.

Williams, Joel Lawson; and Stannett, Vivian Thomas, to Research Corporation. Method of increasing the water absorption of cellulose-containing materials. 4,036,588, Cl. 8-130.100.

Williams, Lloyd E.; and Almagro, Guillermo A., to J. M. Huber Corporation. Inorganic pigments and methods for producing the pigments and aqueous slurries thereof. 4,036,663, Cl. 106-308.00B.

Williams, Merton S., to Emhart Industries, Inc. Lockable spout closure assembly. 4,035,921, Cl. 33-126.70R.

Williams, Peter: *See*—
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Willim, Fritz: *See*—
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Willmott, Colin Barns, to Chamberlain Manufacturing Corporation. Digital radio control. 4,037,201, Cl. 340-167.00R.

Wilson, Fred A., to Dover Corporation. Vapor recovery adapter. 4,036,255, Cl. 137-587.000.

Winderl, Siegfried: *See*—
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Wittmann, Gunther: *See*—
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Woessner, Neal L.: *See*—
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Wojslawowicz, Jack Edward, to RCA Corporation. Vehicular signal light control system. 4,037,195, Cl. 340-66.000.

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Hoppe, Lutz; and Behn, Rudolf, 4,036,821, Cl. 260-78.0SC.

Wolters, Hans Richard; and Keltjens, Heinz, to Mannesmann Aktiengesellschaft. High speed shut off of conduits. 4,036,258, Cl. 137-614.040.

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Yamaguchi, Shunzo: *See*—
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Kawakami, Masato; Andoh, Naoki; Iio, Akira; and Yamanouchi, Haruo, 4,036,901, Cl. 260-669.00R.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.
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Yoshihara, Takahisa: *See*—
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Zeile, Karl: *See*—
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Zellner, Edmond: *See*—
Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl. 423-488.000.
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Hill, Monty B., 4,037,255, Cl. 358-246.000.
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B 24,017	3,914,140	Oct. 21, 1975	B 287,275	3,925,141	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 287,373	3,918,568	Nov. 11, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 289,523	3,921,166	Nov. 18, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,655	3,924,642	Dec. 9,1975
B 258,687	3,914,221	Oct. 21, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,599	3,925,323	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,727	3,914,479	Oct. 21, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 311,977	3,925,233	Dec. 9,1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 313,900	3,915,932	Oct. 28, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,390	3,924,576	Dec. 9,1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,422	4,016,206	Apr. 19, 1977
B 283,124	3,923,512	Dec. 2, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 317,624	3,925,167	Dec. 9, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,122	4,026,905	May 31, 1977
B 285,796	3,914,303	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975

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B 319,402	3,919,568	Nov. 11, 1975	B 345,390	3,940,343	Feb. 24, 1976
B 319,414	3,928,666	Dec. 23, 1975	B 345,422	3,914,392	Oct. 21, 1975
B 320,261	3,924,033	Dec. 2, 1975	B 345,527	3,927,365	Dec. 16, 1975
B 320,452	3,925,083	Dec. 9, 1975	B 345,567	3,913,985	Oct. 21, 1975
B 320,603	3,915,571	Oct. 28, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,018	3,921,623	Nov. 25, 1975	B 346,145	3,913,293	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,621	3,920,863	Nov. 18,1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,261	3,921,304	Nov. 25,1975	B 350,245	3,914,331	Oct. 21, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,200	3,916,021	Oct. 28, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 339,059	3,924,822	Dec. 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,682	3,924,973	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,506	3,916,021	Oct. 28, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 360,719	3,915,715	Oct. 28, 1975
B 360,910	3,925,696	Dec. 9, 1975
B 361,265	3,923,569	Dec. 2, 1975
B 361,347	3,914,642	Oct. 21, 1975
B 361,443	3,927,405	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 361,743	4,035,255	July 12, 1977
B 361,744	4,035,254	July 12, 1977
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,337	3,928,639	Dec. 23, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,674	3,929,716	Dec. 30, 1975
B 363,892	3,913,395	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975
B 364,022	3,913,499	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975
B 364,241	3,916,668	Nov. 4, 1975
B 364,334	3,924,670	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 364,910	3,925,335	Dec. 9, 1975
B 365,371	3,988,181	Oct. 26, 1976
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,287	3,924,946	Dec. 9, 1975
B 366,402	3,928,053	Dec. 23, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 367,739	3,923,648	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975
B 368,081	3,924,691	Dec. 9, 1975
B 368,387	3,924,923	Dec. 9, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975
B 369,607	3,923,786	Dec. 2, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976
B 370,706	3,925,242	Dec. 9, 1975
B 371,073	3,930,135	Dec. 30, 1975
B 371,085	3,923,783	Dec. 2, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975
B 372,823	3,924,660	Dec. 9, 1975
B 373,051	3,914,162	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,742	3,924,392	Dec. 9, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 378,621	3,923,840	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975
B 380,141	3,925,161	Dec. 9, 1975
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 380,926	3,925,095	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,018	3,929,742	Dec. 30, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,290	3,924,717	Dec. 9, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,798	3,924,435	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,465	3,927,412	Dec. 16, 1975
B 383,581	3,925,318	Dec. 9, 1975
B 383,852	3,914,246	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 386,403	3,924,895	Dec. 9, 1975
B 386,592	3,925,305	Dec. 9, 1975
B 387,039	3,924,510	Dec. 9, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 388,580	3,923,712	Dec. 2, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,295	3,914,631	Oct. 21, 1975
B 389,327	3,924,504	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 390,738	4,035,343	July 12, 1977
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,509	3,925,175	Dec. 9, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,154	3,923,809	Dec. 2, 1975
B 392,242	3,926,636	Dec. 16, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,347	3,985,800	Oct. 12, 1976
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,188	3,924,591	Dec. 9, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,027	3,923,736	Dec. 2, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,551	3,924,924	Dec. 9, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,349	3,925,694	Dec. 9, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,080	3,925,163	Dec. 9, 1975
B 400,293	3,923,719	Dec. 2, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 401,133	3,924,443	Dec. 9, 1975
B 401,992	3,924,898	Dec. 9, 1975
B 402,065	3,925,413	Dec. 9, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,290	3,924,918	Dec. 9, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,160	3,924,821	Dec. 9, 1975
B 405,248	3,926,294	Dec. 16, 1975
B 405,305	3,922,111	Nov. 25, 1975
B 405,360	3,913,403	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,495	3,924,577	Dec. 9, 1975
B 405,938	3,920,109	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975
B 406,357	3,924,529	Dec. 9, 1975
B 406,800	3,952,708	Apr. 27, 1976
B 407,357	3,924,614	Dec. 9, 1975
B 407,728	3,925,240	Dec. 9, 1975
B 407,736	3,924,463	Dec. 9, 1975
B 408,380	3,984,172	Oct. 5, 1976
B 408,487	3,924,046	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975
B 409,026	3,925,497	Dec. 9, 1975
B 409,220	3,915,648	Oct. 28, 1975
B 409,251	3,922,620	Nov. 25, 1975
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 425,770	3,989,817	Nov. 2, 1976
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,149	4,037,175	July 19, 1977
B 430,385	4,001,104	Jan. 4, 1977
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 447,417	4,024,727	May 24, 1977
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	b 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 141,963	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb. 24, 1976	Dec 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976	B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976	B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976	B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977	B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977				

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JULY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abo, Hideo: *See*—
Muta, Tohru; Abo, Hideo; and Noguchi, Sakae, Re. 29,313, Cl. 75-128.00A.

Bargain, Michel; Combet, Andre; and Grosjean, Pierre, to Rhone-Poulenc S.A. Cross-linked resins. Re. 29,316, Cl. 260-30.200.

Bone, Arnold R., to Dennison Manufacturing Company. Apparatus for dispensing fasteners. Re. 29,310, Cl. 227-67.000.

Carlson, Edgar, deceased; by Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., to Gulf Research & Development Company. Asphaltene hydrodesulfurization with small catalyst particles in a parallel reactor system. Re. 29,314, Cl. 208-216.000.

Carlson, Edgar, deceased; by Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., to Gulf Research & Development Company. Asphatiene hydrodesulfurization with small catalyst particles utilizing a hydrogen quench for the reaction. Re. 29,315, Cl. 208-216.000.

Combet, Andre: *See*—
Bargain, Michel; Combet, Andre; and Grosjean, Pierre, Re. 29,316, Cl. 260-30.200.

Compton, Leslie E.: *See*—
Mallan, George M.; and Compton, Leslie E., Re. 29,312, Cl. 48-209.000.

Dagenais, Robert, to Dynaflair Corporation Ltd. Protective grille. Re. 29,308, Cl. 160-183.000.

Dennison Manufacturing Company: *See*—
Bone, Arnold R., Re. 29,310, Cl. 227-67.000.

Dynaflair Corporation Ltd.: *See*—
Dagenais, Robert, Re. 29,308, Cl. 160-183.000.

Futs Metalliques Gallay S.A.: *See*—
Wessely, Eugene, Re. 29,307, Cl. 113-120.00R.

Grosjean, Pierre: *See*—
Bargain, Michel; Combet, Andre; and Grosjean, Pierre, Re. 29,316, Cl. 260-30.200.

Gulf Research & Development Company: *See*—
Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,314, Cl. 208-216.000.
Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,315, Cl. 208-216.000.

Gulf Science and Technology Company: *See*—
Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,315, Cl. 208-216.000.

Henke, Alfred M.: *See*—
Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,314, Cl. 208-216.000.
Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,315, Cl. 208-216.000.

Lehrian, William R.: *See*—
Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,315, Cl. 208-216.000.

Lehrina, William R.: *See*—
Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,314, Cl. 208-216.000.

Mallan, George M.; and Compton, Leslie E., to Occidental Petroleum Corporation. Gasification of carbonaceous solids. Re. 29,312, Cl. 48-209.000.

McKinney, Joel D.: *See*—
Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,314, Cl. 208-216.000.
Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,315, Cl. 208-216.000.

Metzger, Kirk J.: *See*—
Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,314, Cl. 208-216.000.
Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M.; Lehrian, William R.; McKinney, Joel D.; and Metzger, Kirk J., Re. 29,315, Cl. 208-216.000.

Muta, Tohru; Abo, Hideo; and Noguchi, Sakae, to Nippon Steel Corporation. Pitting corrosion resistant austenite stainless steel. Re. 29,313, Cl. 75-128.00A.

Nippon Steel Corporation: *See*—
Muta, Tohru; Abo, Hideo; and Noguchi, Sakae, Re. 29,313, Cl. 75-128.00A.

Noguchi, Sakae: *See*—
Muta, Tohru; Abo, Hideo; and Noguchi, Sakae, Re. 29,313, Cl. 75-128.00A.

Occidental Petroleum Corporation: *See*—
Mallan, George M.; and Compton, Leslie E., Re. 29,312, Cl. 48-209.000.

Patterson, William C. Traction arrangement for angularly rotatable sweep auger of circulator grain bins. Re. 29,309, Cl. 214-17.0DA.

Rhone-Poulenc S.A.: *See*—
Bargain, Michel; Combet, Andre; and Grosjean, Pierre, Re. 29,316, Cl. 260-30.200.

Ritter, Erwin A. Painting apparatus. Re. 29,311, Cl. 401-188.00R.

Wessely, Eugene, to Futs Metalliques Gallay S.A. Manufacture of metallic containers. Re. 29,307, Cl. 113-120.00R.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Stribling's Nurseries, Inc. Dwarf nectarine tree. 4,078, 7-19-77, Cl. 41.000.

Anderson, Frederic W., to Reedley Nursery, Inc. Dwarf nectarine tree. 4,079, 7-19-77, Cl. 41.000.

Anderson, Frederic W., to Stark Bro's Nurseries and Orchards Co. Apricot tree. 4,080, 7-19-77, Cl. 39.000.

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree. 4,081, 7-19-77, Cl. 41.000.

Reedley Nursery, Inc.: *See*—
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Bardin, Robert S. Crepe pan. 245,059, 7-19-77, Cl. D7-95.000.

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Genaro, Donald Michael; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,113, Cl. D14-60.000.

Boyd, Donald A., to Production Experts, Inc. Housing for heat dispenser for a tubular fireplace heater. 245,097, 7-19-77, Cl. D23-127.000.

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271 4,036,013
274 4,036,014
282 4,036,015
325 4,036,016
497 4,036,017
520 4,036,018
531 4,036,019
644 4,036,020
692 4,036,021

CLASS 61

3 4,036,022
25 4,036,023
42 4,036,024
53.72 4,036,025
56.5 4,036,026

CLASS 62

6 4,036,027
52 4,036,028
55 4,036,617
4,036,618
123 4,036,619
243 4,036,029
338 4,036,620
394 4,036,621

CLASS 64

1 V 4,036,030
7 4,036,031
21 4,036,032

CLASS 65

3 R 4,036,622
30 E 4,036,623
30 R 4,036,624
134 4,036,625
182 R 4,036,626

CLASS 66

14 4,036,033
50 R 4,036,034
75.2 4,036,035
123 4,036,036
170 4,036,037

CLASS 68

5 C 4,036,038

CLASS 70

90 4,036,039
431 4,036,040

CLASS 71

29 4,036,627
86 4,036,628
88 4,036,629
4,036,630
92 4,036,631
93 4,036,632
106 4,036,633

CLASS 72

8 4,036,041
9 4,036,042
41 4,036,043
85 4,036,044
165 4,036,045
286 4,036,046
329 4,036,056
347 4,036,047

CLASS 73

81 4,036,048
88 R 4,036,057
116 4,036,049
119 A 4,036,050
193 R 4,036,051
194 EM 4,036,052
204 4,036,053
212 4,036,054
312 4,036,055
350 4,036,058
368 4,036,059
4,036,060
410 4,036,061
422 GC 4,036,062
4,036,063
425.6 4,036,064
432 R 4,036,065

CLASS 74

55 4,036,066
112 4,036,067
230.17 E 4,036,068
242.1 TA 4,036,069
242.7 4,036,070
243 R 4,036,071
245 R 4,036,072
393 4,036,073
409 4,036,074
4,036,075
4,036,076
526 4,036,077
529 4,036,078
531 4,036,079
572 4,036,080
781 R 4,036,081
4,036,082
867 4,036,083

CLASS 75

.5 A 4,036,634
49 4,036,635
74 4,036,636
84 4,036,637
101 BE 4,036,639
123 B 4,036,638
126 C 4,036,640
128 A Re.29,313
130 A 4,036,641
164 4,036,642

CLASS 81

7.5 4,036,084
52.3 4,036,085

CLASS 82

24 R 4,036,086

CLASS 83

79 4,036,087
167 4,036,088
198 4,036,089
282 4,036,090
319 4,036,091
471.2 4,036,092
471.3 4,036,093
623 4,036,094
674 4,036,095

CLASS 84

1.01 4,036,096

CLASS 85

5 CP 4,036,097
70 4,036,098

CLASS 86

20 C 4,036,099
4,036,100

CLASS 87

8 4,036,101

CLASS 89

33 BB 4,036,102
35 R 4,036,103
36 H 4,036,104

CLASS 90

11 C 4,036,107
24 F 4,036,105

CLASS 91

5 4,036,106
165 4,036,108
216 A 4,036,109
375 A 4,036,110

CLASS 92

29 4,036,111
80 4,036,112
111 4,036,113

CLASS 93

1 C 4,036,114
8 R 4,036,115
32 4,036,116
51 R 4,036,117
77 FT 4,036,118
4,036,119

CLASS 96

29 D 4,036,643
36 4,036,644
74 4,036,646
76 C 4,036,647
90 R 4,036,648
107 4,036,649
114.1 4,036,650

CLASS 98

43 R 4,036,120

CLASS 99

289 R 4,036,121
533 4,036,122
538 4,036,123

CLASS 100

98 R 4,036,124
100 4,036,125
210 4,036,126

CLASS 101

5 4,036,127
9 4,036,128
120 4,036,129
170 4,036,130
247 4,036,131
288 4,036,132
415.1 4,036,133
426 4,036,134
463 4,036,135
467 4,036,136

CLASS 102

23 4,036,137
24 R 4,036,138
28 R 4,036,139
38 4,036,140
4,036,141
70.2 R 4,036,142
4,036,143
4,036,144
73 R 4,036,145

CLASS 104

1 R 4,036,146
23 R 4,036,147
166 4,036,148

CLASS 105

280 4,036,149

CLASS 106

1 4,036,651
47 R 4,036,653
52 4,036,654
77 4,036,655
88 4,036,656
89 4,036,657
90 4,036,658
4,036,659
4,036,660
273 N 4,036,661
300 4,036,662
308 B 4,036,663
308 N 4,036,652

CLASS 108

20 4,036,151
50 4,036,150

CLASS 110

8 E 4,036,152
8 F 4,036,153

CLASS 111

10 4,036,154

CLASS 112

121.15 4,036,155
121.26 4,036,156
163 4,036,157
258 4,036,158

CLASS 113

1 F 4,036,159
120 R Re.29,307
121 C 4,036,160

CLASS 114

296 4,036,161

CLASS 115

17 4,036,162
34 R 4,036,163
37 4,036,164

CLASS 116

28 R 4,036,165
114.5 4,036,166

CLASS 118

7 4,036,167
8 4,036,168
49.1 4,036,171
66 4,036,169
73 4,036,170
262 4,036,172
306 4,036,173
623 4,036,174
651 4,036,175

CLASS 119

3 4,036,176
18 4,036,177
51 R 4,036,178
4,036,189
96 4,036,179

CLASS 123

3 4,036,180
4,036,181
4,036,182
8.13 4,036,183
32 EA 4,036,186
32 SP 4,036,187
32 ST 4,036,202
41.31 4,036,188
75 B 4,036,184
90.25 4,036,185
117 D 4,036,190
119 A 4,036,191
139 AB 4,036,193
139 AK 4,036,195
139 AT 4,036,192
139 AW 4,036,194
140 R 4,036,196
146.5 A 4,036,197
4,036,198
148 CC 4,036,201
148 E 4,036,199
4,036,200

CLASS 124

21 4,036,203
35 A 4,036,204

CLASS 126

126 4,036,205
270 4,036,206
271 4,036,207
4,036,208
4,036,209

CLASS 127

69 4,036,664

CLASS 128

2 F 4,036,210
4,036,214
2 R 4,036,211
4,036,212
2 S 4,036,213
2.05 D 4,036,216
2.05 F 4,036,215
2.08 4,036,217
4,036,222
4 4,036,218
48 4,036,219
82 4,036,220
145.6 4,036,221
212 4,036,224
218 D 4,036,226
218 M 4,036,225
260 4,036,227
4,036,228
266 4,036,223
268 4,036,229
269 4,036,230
276 4,036,231
278 4,036,232
287 4,036,233
4,036,234
292 4,036,235
317 4,036,236

CLASS 131

17 R 4,036,237
21 B 4,036,238
109 R 4,036,239
173 4,036,240

CLASS 132

7 4,036,241

CLASS 133

4 R 4,036,242

CLASS 134

76 4,036,243

CLASS 135

4 R 4,036,244

CLASS 136

89 C 4,036,645
202 4,036,665

CLASS 137

117 4,036,245
118 4,036,246
236 4,036,247
271 4,036,248
367 4,036,249
476 4,036,250
512.1 4,036,251
527.8 4,036,252
556 4,036,253
581 4,036,254
587 4,036,255
595 4,036,256
614.04 4,036,258
614.06 4,036,257
801 4,036,259

CLASS 138

94.3 4,036,260
96 T 4,036,261

CLASS 139

11 4,036,262
91 4,036,263
92 4,036,264
190 4,036,265
304 4,036,266
336 4,036,267

CLASS 140

124 4,036,268

CLASS 144

1 D 4,036,269
208 E 4,036,270

CLASS 148

1.5 4,036,666
6.2 4,036,667
6.35 4,036,668
11.5 C 4,036,669
12.1 4,036,670
24 4,036,671
175 4,036,672

CLASS 150

54 B 4,036,271

CLASS 152

210 4,036,272
225 R 4,036,273

CLASS 156

71 4,036,673
98 4,036,674
245 4,036,675
273 4,036,676
394 4,036,677
461 4,036,678

CLASS 157

1 4,036,274
13 4,036,275

CLASS 160

183 Re.29,308

CLASS 162

9 4,036,679
65 4,036,680
4,036,681
167 4,036,682
274 4,036,683
290 4,036,684

CLASS 164

7 4,036,276
16 4,036,277
52 4,036,278
57 4,036,279
82 4,036,280
89 4,036,281
123 4,036,282
160 4,036,283
280 4,036,284

CLASS 165

45 4,036,285
4,036,286
55 4,036,287
69 4,036,288
82 4,036,289
105 4,036,290
4,036,291
122 4,036,292
134 4,036,293
154 4,036,294

CLASS 166

.6 4,036,295
250 4,036,297
251 4,036,298
261 4,036,299
273 4,036,300
293 4,036,301
322 4,036,296

CLASS 168

4 4,036,302

CLASS 172

49 4,036,303
260 4,036,304
283 4,036,305
287 4,036,306
749 4,036,307

CLASS 173

75 4,036,308
103 4,036,309
131 4,036,310
169 4,036,311

CLASS 174

15 R 4,037,045
18 4,037,046
68.5 4,037,047

CLASS 175

302 4,036,312
344 4,036,313
364 4,036,314

CLASS 176

19 LD 4,036,685
19 R 4,036,686
37 4,036,687
38 4,036,688
39 4,036,689
40 4,036,690
68 4,036,691
76 4,036,692
87 4,036,700

CLASS 177

1 4,036,315
4,036,316
209 4,036,317
211 4,036,318

CLASS 178

67 4,037,049
69 G 4,037,050

CLASS 179

1 E 4,037,051
1 MF 4,037,052
6 R 4,037,053
15 BF 4,037,054
15 BT 4,037,055
4,037,056
4,037,057
99 4,037,058
4,037,059
100.41 K 4,037,060
115.5 PV 4,037,061
133 4,037,062
147 4,037,063
156 R 4,037,064
170 G 4,037,066
170 NC 4,037,065
184 4,037,067

CLASS 180

5 R 4,036,320
6.48 4,036,321
82 C 4,036,322
105 R 4,036,323

CLASS 181

42 4,036,324

CLASS 182

46 4,036,325

CLASS 184

27 R 4,036,326
55 A 4,036,327

CLASS 188

26 4,036,328
72.7 4,036,329
72.8 4,036,330
187 4,036,331
196 D 4,036,332
264 A 4,036,333
4,036,334
282 4,036,319
319 4,036,335

CLASS 190

18 A 4,036,336

CLASS 191

1 A 4,036,337

CLASS 192

13 R 4,036,338
48.3 4,036,344
58 B 4,036,339
084 4,036,340
106.2 4,036,341
109 F 4,036,342
134 4,036,343

CLASS 193

35 SS 4,036,345

CLASS 194

9 T 4,036,346
48 4,036,347

CLASS 195

1.8 4,036,693
11 4,036,694
51 B 4,036,695
80 R 4,036,696
99 4,036,697
103.5 M 4,036,698
142 4,036,699

CLASS 197

53 4,036,348
151 4,036,349

CLASS 198

420 4,036,350
486 4,036,353
499 4,036,351
4,036,354
607 4,036,355
680 4,036,356
778 4,036,352

CLASS 200

5 F 4,037,068
61.27 4,036,817
86 R 4,037,069
209 4,036,827

CLASS 202

204 4,036,701
248 4,036,702

CLASS 203

57 4,036,703

CLASS 204

1 T 4,036,704
15 4,036,705
4,036,706
20 4,036,707
38 A 4,036,708
43 T 4,036,709
52 R 4,036,710
4,036,711
59 R 4,036,712
98 4,036,713
99 4,036,714
109 4,036,715
147 4,036,716
153 4,036,717
159.14 4,036,719
159.2 4,036,718
177 4,036,720
181 4,036,721
192 EC 4,036,723
195 B 4,036,722
195 R 4,036,724
206 4,036,725
231 4,036,726
268 4,036,727
283 4,036,728
296 4,036,729

CLASS 206

5.1 4,036,357
83.5 4,036,359
.82 4,036,358
204 4,036,360
386 4,036,361
432 4,036,362
526 4,036,363
4,036,364

CLASS 208

8 4,036,730
4,036,731
11 LE 4,036,732
12 4,036,733
57 4,036,734
89 4,036,735
106 4,036,736
108 4,036,737
4,036,738
120 4,036,739
4,036,740
139 4,036,741
4,036,742
4,036,743
216 Re.29,314
Re.29,315
310 Z 4,036,744
4,036,745

CLASS 209

73 4,036,365
166 4,036,746

CLASS 210

22 A 4,036,747
23 H 4,036,748
4,036,749
27 4,036,750
35 4,036,751
46 4,036,752
63 R 4,036,753
139 4,036,754
168 4,036,755
169 4,036,756
196 4,036,757
223 4,036,758
298 4,036,759
323 R 4,036,760
474 4,036,761

CLASS 211

4 4,036,366
37 4,036,367
60 R 4,036,368
88 4,036,369
162 4,036,370
182 4,036,371

CLASS 212

144 4,036,372

CLASS 214

1 BB 4,036,373
4,036,374
6 F 4,036,375
14 4,036,376
17 DA Re.29,309
92 4,036,378
152 4,036,379
305 4,036,380
310 4,036,381
313 4,036,382
4,036,383
334 4,036,384
512 4,036,377

CLASS 215

209 4,036,385
260 4,036,386
309 4,036,387
341 4,036,388

CLASS 219

10.55 A 4,037,070
10.55 F 4,037,071
56 4,037,072
92 4,037,073
121 L 4,037,076
121 LM 4,037,075
121 P 4,037,074
123 4,037,077
137 R 4,037,078
219 4,037,079
328 4,037,080
387 4,037,081
541 4,037,082
552 4,037,083

CLASS 220

3.8 4,036,389
5 A 4,036,390
21 4,036,391
23 4,036,392
206 4,036,393
222 4,036,394
224 4,036,395
242 4,036,396
268 4,036,397
270 4,036,398
303 4,036,399

CLASS 221

67 4,036,400
150 A 4,036,401

CLASS 222

1 4,036,402
23 4,036,403
39 4,036,404
63 4,036,405
181 4,036,406
188 4,036,407
193 4,036,408
249 4,036,409
255 4,036,410
413 4,036,411
490 4,036,412
500 4,036,413

CLASS 223

28 4,036,414
40 4,036,415

CLASS 224

45 N 4,036,417
45 R 4,036,416
48 F 4,036,418

CLASS 225

96.5 4,036,419

CLASS 226

87 4,036,420
185 4,036,421

CLASS 227

67 Re.29,310
110 4,036,422

CLASS 229

43 4,036,423
52 A 4,036,424

CLASS 233

2 4,036,425
7 4,036,426
10 4,036,427
23 R 4,036,428
27 4,036,429

CLASS 235

61.11 E 4,036,430
69 4,037,084
92 LG 4,037,085
92 PE 4,036,431
150.22 4,037,086
151.1 4,037,087
151.21 4,037,088
152 4,037,089
4,037,090
153 AM 4,037,091
156 4,037,092
164 4,037,093
175 4,037,094
183 4,037,095

CLASS 236

35 4,036,432
100 4,036,433

CLASS 239

8 4,036,434
116 4,036,435
183 4,036,436
186 4,036,437
288.5 4,036,438
466 4,036,439

CLASS 240

1.4 4,037,096
3.1 4,037,097
78 R 4,037,098

CLASS 241

20 4,036,440
4,036,441
82.5 4,036,442
297 4,036,443

CLASS 242

35.6 E 4,036,444
37 A 4,036,445
39 4,036,446
43.2 4,036,447
81 4,036,448
107 4,036,449
129 4,036,450
137.1 4,036,451
201 4,036,458

CLASS 244

1 N 4,036,452
3.16 4,036,453
118 R 4,036,455
122 AD 4,036,456
134 D 4,036,457

CLASS 248

11 4,036,459
59 4,036,460
68 R 4,036,461
166 4,036,462
210 4,036,463
309 R 4,036,464
463 4,036,465

CLASS 249

18 4,036,466

CLASS 250

199 4,036,762
214 C 4,036,763
272 4,037,099
281 4,037,100
299 4,036,777
310 4,037,101
336 4,037,102
341 4,037,103
359 4,037,104
367 4,037,105
381 4,037,106
402 4,037,107
427 4,037,108
444 4,037,109
483 4,037,110
505 4,037,111
527 4,037,112
554 4,037,113

CLASS 251

14 4,036,467
84 4,036,468

306 4,036,469
309 4,036,470

CLASS 252

8.5 C 4,036,764
21 4,036,765
48.6 4,036,769
51.5 A 4,036,766
4,036,767
4,036,768
51.5 R 4,036,770
56 R 4,036,771
4,036,772
4,036,773
132 4,036,774
134 4,036,775
187 R 4,036,776
301.21 4,036,778
417 4,036,779
437 4,036,780
439 4,036,781
455 Z 4,036,782
461 4,036,783
465 4,036,784
472 4,036,785
511 4,036,786

CLASS 254

10.5 4,036,473
28 4,036,471
93 HP 4,036,472
124 4,036,474
133 R 4,036,475
172 4,036,476

CLASS 259

41 4,036,477

CLASS 260

2 S 4,036,787
2.1 E 4,036,788
2.5 AG 4,036,791
2.5 AQ 4,036,790
2.5 AR 4,036,789
2.5 AW 4,036,792
2.5 B 4,036,794
2.5 F 4,036,793
18 PN 4,036,795
22 CA 4,036,796
28 P 4,036,798
28 R 4,036,797
28.5 B 4,036,799
29.2 TN 4,036,800
4,036,801
29.6 AN 4,036,803
29.7 SQ 4,036,804
30.2 Re.29,316
37 N 4,036,805
4,036,806
42.15 4,036,807
42.51 4,036,808
45.7 P 4,036,809
45.75 N 4,036,812
45.75 W 4,036,810
4,036,811
46.5 G 4,036,813
47 UA 4,036,814
49 4,036,815
59 R 4,036,816
63 K 4,036,818
75 H 4,036,819
77.5 AM 4,036,820
78 SC 4,036,821
79 4,036,822
112 R 4,036,823
186 4,036,824
196 4,036,825
205 4,036,826
239 BC 4,036,828
239.1 4,036,829
239.3 A 4,036,830
239.55 D 4,036,831
240 R 4,036,832
243 C 4,036,833
4,036,834
4,036,835
250 BN 4,036,837
251 R 4,036,838
256.5 R 4,036,840
293.53 4,036,841
293.58 4,036,842
294.8 R 4,036,843
295 L 4,036,845
295 R 4,036,844
296 F 4,036,802
306.7 C 4,036,846
4,036,847
306.8 D 4,036,848
308 D 4,036,849
309.5 4,036,850
310 D 4,036,851
326.45 4,036,852
326.5 FN 4,036,836
343 4,036,853
343.2 R 4,036,854
343.3 R 4,036,855
4,036,856

345.3 4,036,857
348.5 L 4,036,858
364 4,036,859
369 4,036,860
4,036,861
380 4,036,862
386 4,036,863
397.3 4,036,864
428 4,036,865
429.7 4,036,866
448 A 4,036,867
448.2 N 4,036,868
453 AP 4,036,869
465.3 4,036,870
468 D 4,036,871
4,036,872
473 S 4,036,873
488 B 4,036,874
505 S 4,036,875
514 D 4,036,876
515 R 4,036,877
555 A 4,036,878
561 N 4,036,879
570 D 4,036,880
583 P 4,036,881
584 B 4,036,882
585 B 4,036,883
586 G 4,036,884
599 4,036,885
4,036,886
4,036,887
602 4,036,888
606.5 P 4,036,889
610 B 4,036,890
615.5 4,036,891
617 F 4,036,892
4,036,893
619 A 4,036,894
635 R 4,036,895
648 C 4,036,897
648 R 4,036,896
649 R 4,036,898
654 R 4,036,899
659 R 4,036,900
669 R 4,036,901
673 4,036,902
673.5 4,036,903
681.5 R 4,036,904
682 4,036,905
830 P 4,036,906
857 L 4,036,907
863 4,036,908
874 4,036,909
879 4,036,910
880 R 4,036,911
897 A 4,036,912
938 4,036,913

CLASS 261

79 R 4,036,914
104 4,036,915
109 4,036,916
114 JP 4,036,917
114 R 4,036,918
122 4,036,919

CLASS 264

.5 4,036,920
32 4,036,921
35 4,036,922
45.3 4,036,923
89 4,036,924
94 4,036,925
4,036,926
97 4,036,927
118 4,036,928
132 4,036,929
167 4,036,930
256 4,036,839

CLASS 266

133 4,036,478
195 4,036,479
204 4,036,480
222 4,036,481
252 4,036,482
281 4,036,483

CLASS 269

57 4,036,484
285 4,036,485
303 4,036,486

CLASS 270

71 4,036,487

CLASS 271

186 4,036,488

CLASS 272

49 4,036,489
67 4,036,490
119 4,036,491

CLASS 273

1 M 4,036,493
1 R 4,036,492

1.5 R 4,036,494
43 R 4,036,495
51 4,036,496
101 4,036,497
4,036,498
106.5 B 4,036,499
130 AB 4,036,500
131 K 4,036,501
142 J 4,036,502
153 S 4,036,503
158 4,036,504

CLASS 277

96.2 4,036,505

CLASS 280

21 A 4,036,506
414 A 4,036,507
492 4,036,508
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DESIGN PATENTS

4	:	245,122		245,116	9	:	245,058		245,096		245,112	42	:	245,046
6	:	245,054		245,119			245,060		245,120		245,113			245,101
		245,059		245,121	12	:	245,052	18	: 245,065	35	: 245,055	48	:	245,048
		245,070		245,124			245,078		245,118	36	: 245,061			245,098
		245,073		245,125			245,079	20	: 245,081		245,068			245,102
		245,095	8	: 245,062			245,114	26	: 245,049		245,080			245,103
		245,105		245,063	13	:	245,053		245,050	39	: 245,067			245,104
		245,106		245,075			245,057		245,076		245,097	53	:	245,051
		245,115		245,107	17	:	245,066	34	: 245,069	41	: 245,064	55	:	245,123

PLANT PATENTS

6	: 4,078	4,079	4,080	4,081		

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U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner